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PERSPECTIVES ON ARCHEOLOGICAL SITE PROTECTION AND PRESERVATION

by

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Environmental Laboratory

DEPARTMENT OF THE ARMY

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Preface

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Editor and compiler of the symposium papers which comprise this study was Dr. Paul R. Nickens, Water Resources Engineering Group (WREG), Environmental Engineering Division (EED), EL, WES. Dr. Nickens was employed in the WREG under an Intergovernmental Personnel Act agreement with the University of Colorado.

The study was conducted under the general supervision of Dr. John J. Ingram, Chief, WREG; Dr. Raymond L. Montgomery, Chief, EED; and Dr. John Harrison, Chief, EL. Editor of this report was Ms. Janean C. Shirley of the Information Technology Laboratory, WES.

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| acres | 4,046.873 | square metres |
| feet | 0.3048 | metres |
| inches | 2.54 | centimetres |
| miles (US statute) | 1.609347 | kilometres |
| square miles | 2.589998 | square kilometres |

PERSPECTIVES ON ARCHEOLOGICAL SITE PROTECTION AND PRESERVATION

Introduction

Paul R. Nickens
US Army Engineer Waterways Experiment Station

It is widely recognized that historic properties in the United States, including both historic and prehistoric archeological sites, have for the past century or so, been exploited to the point where their continued existence is in question. Agents of impact leading to the gradual reduction of this important resource are myriad, with the key players being authorized use by archeologists, unauthorized abuse by vandals and artifact collectors, and widespread modification of the landscape brought about by a multitude of natural processes and modern development. The end result of this depletion over the years is that the resource base, which was not plentiful in the first place and has no mechanism to reproduce itself, has dwindled to a severely reduced state. It was not too many years ago that a few enlightened individuals and organizations began forecasting that it would not be too long into the future before there would be little or no resource remaining for future generations of the public to enjoy and visit and for tomorrow's archeologists to study. To prevent this outcome, it was noted that the value of a conservation ethic would have to be instilled not only among the public but also within the professional archeological community and those Federal and State agencies whose mandate includes land management and protection of cultural resources.

In the past 25 years, Federal agencies have substantially increased their efforts toward meeting statutory responsibilities for protecting historic properties located on Federally managed land holdings. These efforts have included passage of important historic preservation authorities and supporting regulations. As a consequence of these actions, comprehensive cultural resource management programs have developed within the various agencies, meaningful penalties serve as a deterrent for those who violate the protective laws and continue to destroy elements of the archeological record, and there has been a critical increase in our awareness of the fragility of the resource, its current state, and its prospects for the future.

Realization on the part of the agencies that legal and ethical responsibilities required proper management of archeological resources on their lands and projects led initially to increased exploitation of the extant in situ resource as large-scale mitigative programs became the rule. Protection and preservation of endangered archeological sites generally involved one of two approaches--sites were either excavated prior to destruction (often only partially because of funding limitations) or they were avoided. Avoidance of sites by impending impacts was, in fact, the stated preference in many of the agencies' management plans, requests for proposals, and other documents.

There are potential difficulties with each of these mitigative approaches. On the positive side, excavation of endangered archeological sites provides much needed data for the ongoing study of past cultures. In addition, it does "protect" the site in the sense that the materials and data are not indiscriminately destroyed but rather are removed and preserved, albeit in accordance with the investigator's skills, resources, and funding support. But while recognizing that a certain quantity of new data is required to support research demands and that, in some cases, data recovery may be the only viable option, excavation should not be wholeheartedly endorsed as the only available mitigative remedy when project-related impacts seriously threaten the continued existence of sites. In fact, data recovery is usually costly, if performed properly, and long-term curation of the artifacts and data can often be an unforeseen long-term burden for the sponsoring agency. More importantly, unjustifiable excavation permanently removes another piece of the already greatly diminished resource base.

Likewise, there are problems with accepting site avoidance as a simple panacea. It is true that a site is momentarily protected when a project is re-engineered or relocated to eliminate damage to or loss of significant archeological sites. What often occurs, however, is that the future well-being of the site usually remains in question since the likelihood of impacts from indirect or secondary sources associated with being located in proximity to an operating project may be increased, especially by unlawful collecting and digging activities. Moreover, the destructive forces of natural processes will continue to adversely affect the site's integrity. In short, project-related factors, such as changes in land use, enhanced access, and creation of new or different erosion patterns, may actually accelerate the rate of destruction at sites originally avoided by construction activities. Without programming of active long-term site management responsibilities, simple

avoidance of sites by agency-sponsored or permitted impacts does not by itself ensure that the site will be preserved well into the future.

In recent years, many of the land-managing agencies have been moving toward a more conservation-oriented approach, one which includes both wise use of the limited resource and taking a more direct role in active protection and preservation of sites. As a consequence, we have witnessed a growth in the implementation of physical protection alternatives or stabilization measures that are designed to provide long-term in-place preservation of the resource. Concurrently, and very importantly, there has been increased interest in sharing information about developments and uses of various technologies and strategies to protect and preserve sites throughout the country.

The collected essays in this volume contribute to the need for dissemination of information pertaining to archeological site protection and preservation undertakings. The papers originate from two symposia, both organized under auspices of the "Field Preservation of Cultural Sites" research effort of the Corps of Engineers' Environmental Impact Research Program, which is managed at the US Army Engineer Waterways Experiment Station (WES). In 1988, James J. Hester, then on temporary duty at WES, organized and chaired a symposium entitled, "Adoption of Archeological Site Preservation Technology," at the Society for Applied Anthropology Annual Meeting, Tampa, FL. Papers included herein from that session are those authored by Hester, Thorne, Ebert, Henderson, and Dunn. The remainder of the papers were presented at the 1990 Annual Meeting of the Society for American Archaeology, held at Las Vegas, NV, as part of the symposium "Current Issues in Archeological Site Protection and Preservation," organized and chaired by the volume Editor.

The papers cover a number of relevant themes related to the subject of archeological site protection and preservation. The first three (Hester, Thorne, and Ebert) discuss some of the theoretical aspects of the topic, including the role of site preservation within the archeological profession. The papers by Fosberg, Walker, Nickens, Maxon, Pilles, and Lynott serve to acquaint the reader with current site preservation thinking and activities within the various land-managing agencies and in the private sector. The remaining papers (Briuer, Nordby, Henderson, and Dunn) provide some case studies of site preservation efforts. Roger T. Saucier, Program Manager of the Environmental Impact Research Program at WES, served as a discussant at both symposia and concludes the volume with his thoughts on the current status of site preservation.

As editor of this report and current principal investigator for the WES site preservation research program, I would like to express my appreciation to Dr. Hester for generously permitting inclusion of the papers from the earlier symposium and to Dr. Saucier for his continued overall program management and support of the research effort. Additionally, all of the contributors are acknowledged for their willingness to prepare and present the original symposium papers, and for their continued efforts in support of the preparation of this volume.

Issues in the Preservation of Archeological Sites

James J. Hester
University of Colorado

Introduction

The protection and preservation of archeological sites is in its infancy. Research to date reveals that there is no coherent body of relevant literature and the archeological professional has limited experience with or knowledge of preservation techniques. Previously and continuing to date the entire profession has relied on either site mitigation by means of excavation or site avoidance to treat threatened sites. The third alternative, protecting sites in situ, is rarely selected. Even so, the problem is not one of an absence of protective measures, as a number of techniques have been adopted to the preservation of sites.* The problem is due to a lack of will in some instances and a lack of funds or knowledge in others. In any event, at present there is no actively involved site preservation constituency. Archeologists are trained to excavate; they think in terms of problems which may be studied by means of excavated data, and they think of survey techniques as a refined method for the identification of sites suitable for excavation. Even the process of nomination of sites to the National Register of Historic Places is based on the sites' potential to yield "information of importance to history and prehistory." The value system so established is clear - sites are not valuable in themselves but only for the information they contain and the way to acquire that information is through scientific excavation. Pursuing this value further we can identify the primary complaint that professionals level at site vandals and looters, i.e., illegal and untrained excavations result in a loss of information. The loss of sites is deplored but what is deemed critical is the loss of information. I am not in disagreement with this value system; however, to date it has resulted in more emphasis being placed on excavation rather than in situ preservation, when in fact both methods provide a means for the mitigation of impacts.

* Thorne, Robert M., Fay, Patricia M., and Hester, James J. 1987. "Archaeological Site Preservation Techniques: A Preliminary Review," Technical Report EL-87-3, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

Problems in Generating Support for Preservation

The absence of a preservation constituency has other ramifications as well. Academic values are attached to research-oriented concerns and activities. Promotions, salary increases, job opportunities, and tenure are all linked to research-oriented activities and products. So important are the citation indexes of the professional research literature that university deans refer to them before approving departmental recommendations for promotion and tenure. Viewed in simple pragmatic terms we can ask "If I preserve a site, what is in it for me?" The answer is slim to none in terms of academic values - little credit, few publications, and limited recognition or rewards of any kind. Further, site preservation activities require time and effort which could, if spent on other projects, produce research publications, etc., resulting in academic recognition. Therefore the result is, in fact, negative. Site preservation activities are not neutral, but detract from professional researchers' career efforts and reduce their overall record for productivity. Such activities as site preservation are credited as "public service," a category receiving a lower level of recognition.

Meanwhile, in another venue, that of professionals working for State and Federal agencies, their responsibilities toward sites are more closely tied to specific requirements within historic preservation laws and regulations. Sites are mitigated, avoided, and managed under these statutes but preservation per se is seldom attempted, as funding is tied to specific projects and once the project is completed there are no longer resources available to maintain sites. Therefore the initiation of site preservation techniques followed by periodic maintenance and monitoring of the effectiveness of the treatment is seldom the option chosen.

What Is Needed - Some Suggestions

What is needed is a new ethic, a site preservation ethic, which is a logical alternative to data recovery or site avoidance. In fact site avoidance is often only a temporary solution, more apparent than real. Sites that were avoided by one project have been subjected to other impacts at a later date. The conclusion thus is that site avoidance does not equal site preservation although many management plans make such an assumption.

If we adopt in situ site preservation as an equally important use of cultural property then how do we get our professional colleagues to become actively involved? In contrast to excavation, site preservation is inherently less exciting; the discovery factor or treasure hunting aspect is not present. Similarly at present there is limited opportunity for a prestigious journal to accept an article on site preservation as this is not a subject with a high level of current interest. How then can we stimulate site preservation activities and associated publications? One approach is to think through the entire process to identify its characteristics and then by analogy link it to other values in our society. Essentially site preservation is a form of banking. Sites are preserved for future use in much the same fashion as one establishes a savings account. Assets are placed in trust for future use rather than being consumed in the present. The process involves self-denial and the postponement of pleasure in order to experience gratification in the future. Part of the motivation to save is also based on fear, the concern that there will come a time in the future when such savings will provide an absolutely crucial financial cushion. We have a similar situation with respect to archeological sites. The current rate of site loss is significant and continuing. In another statement,* I have estimated that current site loss from erosion, construction, vandalism, etc. is occurring at a rate of approximately 1 percent per year. In addition, many sites have already suffered damage from such impacts. The recent General Accounting Office report** on vandalism states that one third of all sites known in the "Four Corners" states have been damaged by illegal excavations. Therefore the number of sites in good condition is much less than the total number of sites remaining. If continued, site loss at this rate will eventually reduce the number of sites available for excavation to a level that is less than the demand for suitable sites for research. Surely this concern meets our need for a fear stimulus! Further restrictions include sites being placed off-limits by land managing agencies for a variety of reasons, such as wilderness designations or closure to mining. Finally, there is the non-study of sites being the option

* Hester, James J. 1987. "A Crisis in Our Time, a Call to Arms to Create a Site Bank," SOPA Newsletter, Vol 11, No. 5, pp 2-4.

** US Government General Accounting Office. 1987. "Cultural Resources: Problems Protecting and Preserving Federal Archaeological Resources," GAO/RCED-88-3, Washington, DC.

preferred by Native Americans. Thus, reburial and other Native American concerns will also restrict the number of sites available for future scientific research. The trends are all in the same direction, fewer available sites in the future, fewer accessible, and fewer that are undamaged.

Continuing our analogy with saving, site preservation activities may never become the prevalent alternative practiced; after all, we spend the majority of our income for current consumption. Saving, as a percentage of income, amounts to only 3 percent in the United States. This 3-percent solution seems equally applicable to site preservation. If we can "save" 3 percent of the sites that are threatened, then we can simultaneously have 97 percent available for current scientific study. The 3 percent that are "saved" will be available for future consumption. Two attitudes can be considered here; if we assume the "saved" sites will be available to us individually and personally in our lifetimes for research purposes, then we are simply and selfishly saving for our own future consumption. If, on the other hand, we are "saving" sites for the consumption of future generations of archeologists then our "saving" would be in the public interest. Whereas there are groups that advocate such public service in other fields, primarily in terms of environmental conservation, protection of endangered species, etc., no such group in archeology has developed an active, large, or effective constituency. The American Society for Conservation Archaeology and the Archaeological Conservancy both have more limited goals than is advocated here. However, for these or any other groups to achieve our 3-percent solution would require that a majority of practicing professional archeologists become actively involved in some aspects of site protection activities.

Recognizing that people do best and most willingly that which is in their own self interest, we need to devise a set of rewards for site preservation activities. This task could best be accomplished, in my opinion, by the scientific societies in archeology establishing a series of awards for site preservation. Further, these societies could establish a category of articles in their publications concerned with preservation technology. Thus experimental efforts could be reported and their developers could receive the professional recognition they deserve.

As an example, academic archeologists can become familiar with in situ preservation technologies and bid on preservation contracts. On the other side of the equation, public archeologists working for State and Federal agencies can develop more scopes of work that emphasize in situ preservation. If

preservation efforts are taken seriously, then the preparation of publications dealing with their execution and success or failure would become routine practice and as a result lead to professional recognition.

Preservation Is a Use

Robert M. Thorne
National Clearinghouse for Archaeological Site Stabilization
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In the last three decades, anthropological archeologists have been exposed to the theoretical orientation of the new archeology and, almost simultaneously, found our professional interests legislated and regulated in a manner that is peculiar to no other of the social sciences. Expertise levels are defined for the various classes of archeologists and the latitude of our research is frequently defined by scopes of work that are prepared in response to extra-archeology needs. The terms that we use have expanded beyond those that have traditionally been used in archeological explanation. Among the commonly used terms and phrases that are of interest here are: UNDERTAKING when it is applied to a recommended MITIGATION effort that requires destruction of a property through excavation, once we have judged the SIGNIFICANCE OF THE RESOURCE. As a nondestructive alternative to mitigating an ADVERSE EFFECT, we can resort to PRESERVATION and STABILIZATION. These concepts of preservation and stabilization are the focus of this paper.

The archeological community seems basically uncomfortable with and somewhat resistant to the notion that site stabilization and preservation are the preferred choices for mitigation of an adverse effect. The adequacy of this form of resource maintenance has been addressed judicially and precedence has been set. A key element in the recent settlement of a cultural resources management suit against Region 3 of the US Forest Service directly addresses site stabilization and preservation (US District Court 1986). Further, ER-1130-2-438, "Project Construction and Operation, Historic Preservation Program" (US Army Corps of Engineers 1987), calls for the development of management plans for new as well as operational projects, and both require that the issue of site stabilization be considered. Enabling legislation, regulation, and judicial decree (Bell 1985) are now in place to encourage planned maintenance of archeological properties.

Resource protection and maintenance are not new ideas in so far as our legislated, regulated, and perceived responsibilities are concerned, and date to the first decade of this century at the Federal level (US Government 1906) and earlier at the local level (Putnam 1890, p 873). Even though few people openly question the need for resource stabilization and maintenance, their

practice as a practical and primary method of resource treatment has been slow in coming.

Lipe's (1974, pp 213-245) presentation of a conservation model has, to some degree, set the stage for site preservation. As a part of that model, he emphasized public education and the involvement of professional archeologists in the planning process. Land managing agencies are becoming less resistant to the management of archeological resources. Agency staff and consulting archeologists are now actively participating in the planning and land management process. Public awareness of the value of undisturbed resources is being heightened by opening some sites to public use while others are being closed with accompanying media explanation. While some progress along the lines of Lipe's model can be demonstrated, the need for additional public awareness has recently been pointed out again (US Government Office of Technology Assessment 1986, p 25). By necessity, the orientation of public education regarding the value of cultural resources must be markedly different from the formal and continuing education of professional archeologists. McGimsey, Davis, and Chapman (1970) proposed that all Americans are "stewards of the past" and tried to draw the public into the preservation movement. However, the main responsibility for guiding that stewardship largely remains in the hands of cultural resource managers, including both archeologists and other land managers.

Earlier I alluded to a negative attitude on the part of some archeologists to the use of stabilization as a viable management tool. That attitude exists for several reasons. First, archeologists are rigorously trained to recover data in a carefully orchestrated manner that completely destroys the information-containing matrix. Considerable effort is given to the enculturation of each succeeding generation of archeologists, both in hands-on field situations and through a variety of introductory textbooks. Field schools have historically emphasized field technique and interpretive expertise. While introductory archeology texts (e.g., Sharer and Ashmore (1979), Rathje and Schiffer (1982), and Hester and Grady (1982)) treat these areas in considerable detail, these texts do little more than introduce the idea that site preservation is one of our primary responsibilities as managers of a finite and non-renewable resource. Historically the nature of our discipline has been defined as consumptive, but the continuing use of our resource base is likely to force us to change that orientation. As an alternative to the use of our shrinking resource base for primary teaching, I would like to

suggest that purely instructional archaeology field schools be carried out on mid-20th century sites. We would not be losing one of our early resources and students would be excavating material that they could readily identify and interpret. Still another alternative would be to have field school students test a site and then install some stabilization measure. I do not believe we can today justify the excavation of a site simply because it is conveniently located or students require training. If we continue to follow traditionally accepted training techniques, site excavation should follow a carefully devised research plan that will insure that field school data contribute directly to our expanding interpretive base.

A second reason for preservation resistance can be traced to very recent events. When large sums of money became available as a result of passage of Moss-Bennett legislation, mitigation through excavation was emphasized even though site avoidance was also perceived as a viable alternative. Avoidance often seems to have been equated with preservation. During the early years of intensive mitigation archaeology, some of our colleagues recommended that sites be avoided by the primary impact of ongoing construction, only to see those sites destroyed as a result of some later secondary impacts. These losses occurred even though the sites had been "saved" initially. Site loss under these circumstances has left some colleagues suspicious of any attempt to stabilize and preserve sites. Avoidance is a legitimate means of mitigation, but it must be coupled with a management plan to guarantee the safety of the site once construction is completed.

Finally, while many archaeologists recognize the desirability of resource preservation, they have not been convinced that appropriate stabilization technologies are available (US Congress, Office of Technology Assessment 1986, p 8). In an attempt to provide that information, I have worked with the Tennessee Valley Authority's Cultural Resources Program and the US Army Engineer Waterways Experiment Station to synthesize and present some of our (past professional) experiences (Thorne 1985; Thorne, Fay, and Hester 1987). Fay (1987) has reported on some of the experimental stabilization efforts being conducted by the University of Mississippi and the Tennessee Valley Authority, (TVA) and I have prepared a modeled approach for site stabilization (Thorne 1988). The National Clearinghouse for Archeological Site Stabilization has been established at the University of Mississippi through a three-way cooperative agreement between the Cultural Resources Program of the TVA, the Consulting Archeologist's Office of the National Park Service and the Center for

Archeological Research at the University. Among the goals of the Clearing-house is the dissemination of technical information to aid in site stabilization efforts.

As noted earlier, the development of research designs and concomitant techniques and methodology have structured the way in which archeological resources have been treated in the last three decades. Archeologists have been acculturated into the engineering, law, business administration, and public relations professions to an extent that was unknown 30 years ago. Many of the skills and much of the knowledge necessary to manage archeological resources has been drawn from a variety of disciplines and professions.

The approaches that we adopt consist of tested technologies proven to be effective in environments whose parameters have been carefully defined. Not only do we borrow a technique but we also acquire a terminology that is both unyielding and frequently technology specific. As a result, our thinking about site stabilization may be guided by non-archeologists. I also feel that this situation causes us to think about archeological site stabilization in a manner that stifles innovative attempts to apply existing technologies. I am suggesting that language shapes behavior in much the same way that Sapir and Whorf approached the relationship of language and the world of reality (Schaff 1973, p 62).

As an example of how one use of discipline-specific language structures the use of archeological resources, I know of two major archeological properties that are situated on islands. Both are in the public domain and are used as wildlife management areas by a state's division of wildlife conservation. Both are referred to as refuges and the implication, if not the reality, is that neither area is open to public use. The term refuge is the definitive key word. Refuge implies a haven that is safe from all intrusion. Management of renewable resources is actively pursued in these areas while management of the archeological resources is a secondary concern on the part of the controlling agency. The general public is discouraged from viewing the archeological resource and public intrusion is not permitted. While I support the dedicated use of the management areas, I think that a more innovative approach would be to open access to the archeological sites and portions of these refuges for public visitation. Signs designating specific parts of each island for public use could be placed in appropriate locations and a series of explanatory signs could also be placed around each of the archeological sites. Further, boldface signs inviting public use of these areas and a public

stewardship charge for all of the resources should be posted. Each sign should also indicate that any misdeed by a single perpetrator could lead to the closing of the area to all future public use.

I do feel that utilizing these particular sites in this manner would improve our effort to draw the public into archeological site conservation while at the same time reaping the benefits of successful wildlife management. For most US citizens, the only opportunity to see eagles on the nest, migrating sand hill cranes, and explanations of prehistoric human behavior are through public television. Why not provide them with a first-hand opportunity? We can utilize the educational process as Lipe suggested, and, at the same time, place part of the stewardship responsibility in the hands of the very people we are saving the resources for.

Drawing the public into efforts to hold sites safe will not necessarily be as easy as it might be if the resource we seek to protect were a living entity. As a consequence, cultural resource protectionists must address several realities. First, most archeological research is written for the use of the other social scientists and holds little or no appeal for the public. The direct result is that there is little public understanding of why cultural resources should be protected and why one should not be allowed to collect artifacts or dig holes indiscriminately. Further, I suspect that the vast majority of the general public is indifferent to archeological resources. Sites can be saved or lost and the course of human events will not be greatly changed.

Another reality that has yet to be adequately addressed concerns the real world of agency construction and prescribed land use patterns and the place of cultural resource management within that context. While Federal land managers are indeed becoming less resistant to cultural resource management, I suspect that there is little priority placed on these resources by most land managers. These same land managers must balance the reality of project needs against resource management. Again, I believe that the fault lies with professional archeologists and our inability or lack of initiative in educating people about the value of the diverse information that archeological sites contain.

Since cultural resources are only a small portion of our total environment, management approaches must be developed that are resource specific. Since our cultural heritage is inanimate, it does not have the capacity to respond to the same kinds of management techniques that have been used to

reestablish or replenish endangered species. While it may sound simplistic to say that cultural resources are not regenerative, we seem to follow the precept that the resources are really infinite. We must continually remind both professional archeologists and the general public that examples of all forms of resources must be jealously guarded. We, individually and collectively, are truly the stewards of the past and we are all responsible for maintaining the tangible links between the present and past generations.

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"In Situ" Preservation of Cultural Resources
and the Future of Archeology as a Science and Profession

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Introduction

The preservation of significant archeological sites and properties is currently mandated by Federal law and advocated by the archeological profession. The purpose of this paper is to examine two very real logical contradictions involved in this advocacy: the realistic theoretical basis for preserving "sites," and the possible futility of assuming that we have any economic base that warrants their preservation.

It is suggested in this paper that archeological theory and method are perhaps not, currently, convergent in their directions and that archeological theory may not for very much longer be directed toward the discovery and preservation of "sites" as discrete and rare entities; it may very soon be landscapes that need to be preserved and studied. New technologies are available which will facilitate the discovery and recording of those portions of the landscape that need to be preserved.

The present and future economic bases which will encourage and enable in situ preservation are also discussed. There may soon be a theoretical change in the "basic units" of scientific archeology involving a methodological shift in focus from sites to landscapes. However, this may be difficult or perhaps impossible to operationalize in terms of current cultural resource management laws and policies, and government preservation efforts will continue for some time to be bound by the "site" concept. At least in the "short run," then, we need to step up our actual in situ preservation efforts to meet the needs of government programs. The conclusion of this paper is that there is, and at least for some time will continue to be, a market for the development of methods for measuring changes in or impacts to archeological sites. This milieu supports the need for preservation efforts, for the development of preservation methods that actually will be effective, and finally for actual applications of in situ preservation.

In Situ Preservation and the Current and Future State
of Archeological Theory and Method

"Archeological theory and method" is a popular and often meaningless catch-all topic at many archeological meetings today, one under which many otherwise unclassifiable papers are lumped. Here, our argument is that theory (what we want to know, study, and learn about) and method (the ways we go about discovering and measuring data relevant to that theory) are inescapably related to one another in a perhaps circular but nonetheless inseparable way. While under a "deductive" scenario, method should be determined by theory, it is also just as true that theory--or that theory we can pursue--is related to the methods which are available or possible under the current technological state of the art.

Archeological theory has been, in the hundred years or so that this science has existed, directed by the recording methods that we have at our disposal. Archeology's data consist of things that people left behind during the course of their past activities. Traditional and yet-current archeological recording methods have been limited for practical reasons to searching the landscape for "sites," or concentrations of artifacts and features, and using the results of such searches (or surveys) as a guide to determining where excavations or intensive studies can be carried out.

The archeological record is basically discovered and recorded in terms of "sites" as basic analytical units. These are concentrated places in which past people carried out their technological activities, and which are perceived as occupying a small proportion of the total landscape. After all, in our own vernacular experience, and through the observation of anthropologists, certain places are better than other places for "doing things." When we go camping, we pick the best spots, near streams but far enough away that insects are not bothersome. We like a nice view, but also a certain amount of shelter from the wind. Anthropologically, bushmen (for instance) camp within walking distance from pans, but far enough away so that prey animals are not frightened by the human presence. Agricultural peoples make their fields at places where the soil is best. Resource locations, in general, are important in the decisions of living, resulting in groups determining where to place their residences and resource-collecting locations.

Since the early decades of this century, archeologists reading the accounts of ethnologists (and in fact participating in being ethnologists, in

addition to coining such terms as "ethnoarcheology,") have translated the ethnographic record directly into archeological ideas -- the basis of current archeological theory. We walk systematically across the landscape, albeit at a "low resolution" (typical "transect intervals" are 30 or even 50 m apart), and when dense clusters of artifacts or especially structural evidence are found, they are noted as "sites." One or a few artifacts or features are called "isolated occurrences" and almost literally ignored, being indicative of "sporadic" use or discard.

Sites are where people really did things, and as such they are additionally supposed to have some measure of "integrity." They contain activity areas, and while the "surface manifestations" by which these are identified may not be pristine, it is supposed that their excavated contents will be. Sites are where the information important to reconstructions of the past, and for discovering information useful in tracing cultural evolution, are to be found.

Sites are also the entities that are marked for preservation. The use of the term "in situ preservation" belies this methodological direction. There are a number of implicit or explicit assumptions involved in the choice of those archeological sites to be preserved. The most basic of these is the assumption that at least the "encapsulated" materials in sites are static for either short or long time periods. Another is that the record left in the form of "occupations" or "activity areas" in sites, separated in depositional strata, are resolvable and can thus serve as either "snapshots" of the past, or include a series of such snapshots for use in cultural-evolutionary scenarios. Sites are deemed most significant (and thus worthy of preservation) if they are unique, or at least "representative;" if they are large and have deep deposits; and if they are "multicomponent" in nature.

New Methodology and Another Interpretation of the Archeological Record

I would like to suggest here that the meaning that archeologists have traditionally given to the archeological record springs at least partly from the methodologies that they have always employed. This is partly due to unsailable authority and partly due to the techniques which have (until very recently) been the only ones available to archeology.

I would also suggest, in a more general way, that if one adopts a somewhat different "theoretical" view of the nature of the archeological record and its meaning, new techniques for discovering and recording it result. Therefore, in that patently circular way that characterizes all sciences, our results include new meanings and implications -- especially in terms of what we need to preserve and study.

For at least the last 15 years, however, a growing number of archeologists have been pursuing the discovery and measurement of the archeological record in a "non-site" manner. On the basis of a number of new theoretical directions, as well as frustration with attempting to characterize "sites," and to define their boundaries, some archeologists have turned to looking instead only at the distributions of artifacts and features rather than assuming that they are seeing snapshots of the past as they walk across the landscape.

Non-site or distributional archeological methods involve higher resolution discovery (with typical "transect intervals" of 5 m or less), and the recording of individual occurrences of cultural items.

When one searches for such actual, physical manifestations of past activities, the nature of the "picture" that we see in the archeological record is suddenly transformed. Instead of distinct clusters of artifacts and features, it appears that archeological materials are relatively continuously distributed across the landscape. There are clusters, to be sure, but they are difficult to bound in any but an arbitrary manner.

When one thinks about the extremely long time periods that archeologists are supposed to be thinking about all the time, in fact, this is not surprising. Even in the United States, where archeologists are willing to admit to only 10,000 years or so of continuous occupation of most areas, places must have been used repetitively by hundreds of generations of people. Ethnographic accounts of Great Basin groups, for instance, suggest that single groups demonstrably returned several times each year to the same general "places"--with camps near their last ones, but for a number of reasons not completely or even necessarily ever exactly overlapping with the prior locations.

To complete a brief argument concerning the continuousness of archeological distributions across the landscape, it is necessary only to consider the nature of "archeological encapsulation." Only in the rarest of circumstances--for instance in alluvial deposits in large, annually flooded

river bottoms--would archeological materials be covered and stratigraphically separated with any sort of integrity each year. In other, in fact in most, situations, all archeological materials would be "surface" materials throughout tens or even hundreds of years.

This sort of archeological record would be subject to many sorts of natural disturbance, certainly, but even more important to its final nature would be the cultural disturbance it would be vulnerable to. To fall back on a bit of "ethnographic wisdom," we are expert scavengers, and some of the main things that past people would have been "scavenging" (picking up and reworking and using again) would have been stone tools and the other materials that they or previous users of places would have collected and concentrated. It is very likely, in my estimation, that one of the major factors influencing the archeological record was the continuous and repetitive relocation, concentration, reworking, and reuse of stone and other materials. Assuming that the archeological record has "integrity" in terms of its being the basis for "reconstructing" all but the last activities that took place at any location, then, is an illusion. The archeological record, instead of being a reflection or "snapshot" of past activities, is instead in most places a much more cumulative entity.

What we are left with, in effect, is an archeological record which constitutes a very long-term "time exposure" rather than a series of snapshots. The archeological record itself still has high resolution, but our ability to impart meaning to this resolution is determined and/or limited by our analytical methods. To draw out this analogy for a moment, a time exposure of automobile lights on a New York street would show all of the cars stopped at traffic lights if the camera taking it were shuttered at an interval of a minute or two, but if the camera shutter were left open for hours it would show lights everywhere. The archeological record is recorded with a "shutter time" of many thousands of years.

Rather than digressing into a discussion of the specific analytical methods that would be productive given this sort of scenario, I will only say here that this view of the archeological record might give one pause when attempting to decide which "sites" are most significant, and which to preserve.

Currently, many methods are being devised to allow the recording of the archeological record at high contemporary resolution. These include high-resolution survey and identification of individual archeological objects

rather than sites, the use of electronic distance measurement (EDM) devices and in-field computers for characterizing the many thousands of objects found in relatively small land areas, and the use of geographic information systems (GIS) for storing and analyzing those data.

All of us, of course, have heard so many claims about "new technologies" that we probably automatically ignore most of them. Especially in government circles (or academic circles directing their efforts at exploiting government circles), one is bombarded with claims that new technologies will make archeology, anthropology, or cultural resource management more "economical" or "cost-effective." My observation is that new technologies rarely make anything cheaper or faster in any direct way. Is making archeology cheap and fast what we want to do anyway? Surely not; the value of new technologies lie in the ways they let us record new and different sorts of data that we could not record or in some cases even detect previously, and the new ways that those data let us consider the theoretical basis of our sciences.

EDM's and computers and GIS systems can of course be used for "traditional" archeological purposes, and in fact their use in such ways is lauded each month in professional journals. But when coupled with new ways of perceiving and interpreting the data they collect and store, they may in fact aid in qualitative rather than simple quantitative changes in the science of archeology (Figures 1 and 2). My feeling, or at least hope, is that we may be on the verge of such changes today. If we are at such a threshold of change, these changes will have profound implications for archeological preservation. When the future for which we have preserved archeological sites arrives, it will not necessarily or even probably be "sites" that archeologists will want to examine or analyze. It will instead be the distribution of all cultural materials and evidence across large, continuous landscapes.

Here, before going on, I want to mention that I do not find this alarming but rather encouraging. It is in a very real sense impossible to "preserve sites" at all, since they are not in fact ever static entities, either during their formation or post-depositionally. Only information can be preserved, and it may be that very soon we will actually have technical means at our disposal to completely and accurately record archeological distributions across landscapes. It will not be cheaper or more efficient in any way comparable to what archeologists do today. It will be completely different.

Seedskaade Archaeological Project

Unit 28

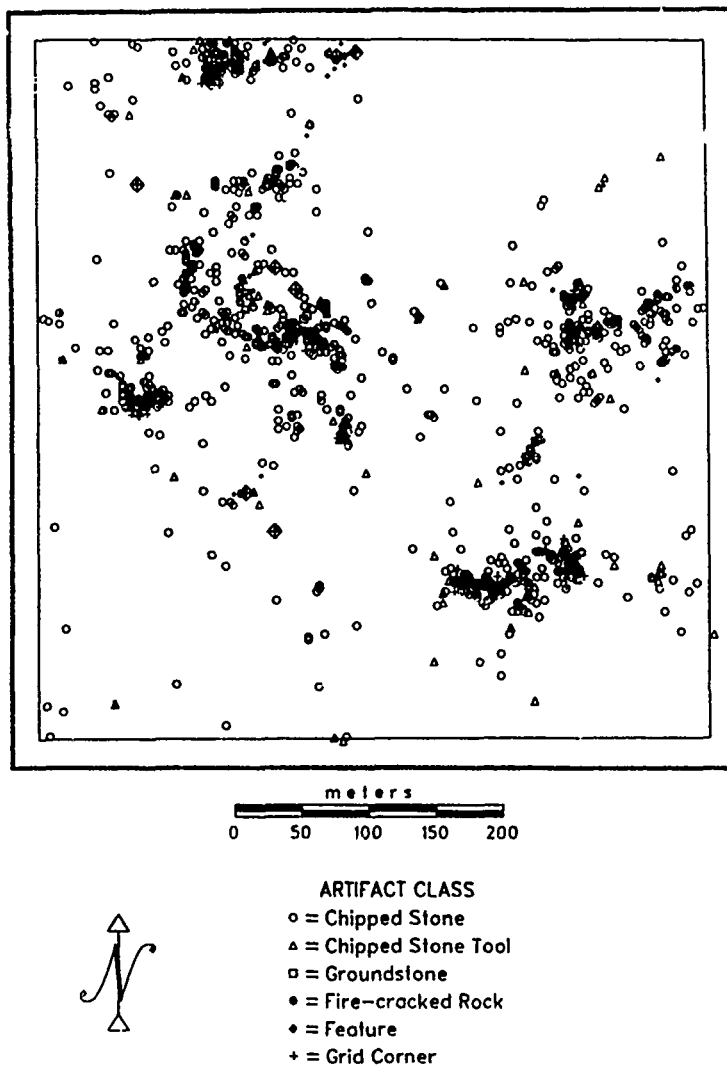


Figure 1. New technology (centimeter-resolution mapping with electronic distance measurement or EDM transits), coupled with new methods (intensive, consistent surface survey making no assumptions about the existence or bounding of "sites") yields a different view of past human use of the landscape. This 500- by 500-m unit in southwestern Wyoming was surveyed and recorded using techniques described in the text as *distributional archeology*

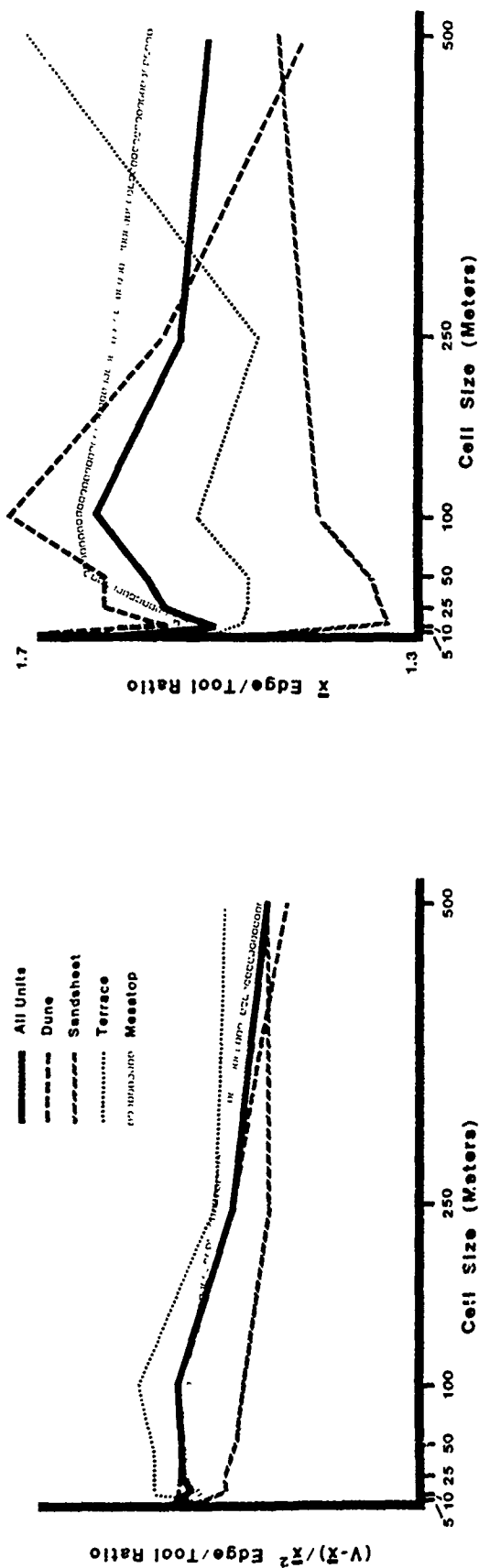


Figure 2. High-resolution mapping of all discrete, discoverable archaeological items over large, contiguous areas such as that shown in Figure 1 allows analyses which have not been available previously. The two graphs in this figure show values of the mean edge-per-tool ratio (lower), and its variance-to-mean ratio (upper), as sampling frames of variable sizes successively superimposed over the point-resolution data universe. It is as if the 500- by 500-m squares were resurveyed many times, using a different "grid size" to show artifact provenience--only the high-resolution distributional data allow this to be done statistically. Some archeologists have used such analytical methods with small "sites," but never across landscapes at the scale shown here

The Economic Basis of Archeological Science
and the Profession of Archeology

Now I would like to "shift gears" for a moment, and consider not archeological theory and method, but rather a much more practical and perhaps even more important area with implications for the future of archeological site preservation--and in fact for archeology in general. That area is the economic basis for archeology.

Every science and profession must have an economic basis, a method of "paying its way." We are all very much involved in thinking about this aspect of our academic pursuits, perhaps as much or more than in its more esoteric aspects. As "applied anthropologists," I would like you to think about applying your own area of expertise in analyzing and perhaps helping archeologists improve this aspect of our science in the very near future. If we do not, the question of which archeological materials to preserve, and their value in any sense in the future, may be a "moot point."

Ebert & Associates is a private sector firm involved in the application of technological means, particularly remote sensing and geographic information systems, to (among other things) archeological studies. In this capacity, we have recently completed the first phase of a Small Business Innovation and Research (SBIR) research grant funded by the National Science Foundation (NSF) concerning the "Feasibility of a System for Instrument Assisted Distributional Archeological Survey" (NSF award ISI-8660765). We are currently proposing Phase II of this research, and while we have been recommended for the technical award, a part of the SBIR procedure is to seek "follow-on funding," that is, additional support following that Phase II grant, from private enterprises.

In the course of seeking such "follow-on funding," I have had to become more of a businessperson than I would like to be, and have discussed our plans with dozens of sources of such additional funds, including venture capitalists. This is not an area that you really want to get into if you can avoid it; it has certainly proved disheartening (if instructive) to me.

I would like to relate one of my experiences to you--one which has implications in terms of the future of in situ archeological preservation and archeology in general.

In order to better communicate with venture capitalists, we devised a brief "business plan" describing our proposed product and its prospective

market, which I sent or took to a number of businesses and venture capitalists. One capitalist was willing to discuss it in person. Prior to our discussion, on the basis of many telephone calls, some of them to the government agencies which are "in the know" about the archeological market, I had determined that slightly more than \$300 million dollars are spent on archeology each year in the United States: \$100 million on government archeology, \$100 million on cultural resource management activities by the private sector, and \$100 million on "academic" archeology.

When I visited my venture capitalist prospect, he told me that on further analysis he had determined that even if we could capture a large proportion of that market, it was not worth any investor's consideration. He then asked me if I would like to see an example of a truly promising product with a worthwhile market. Taking me into an adjacent office (he maintains offices for promising, beginning businesses), he introduced me to the inventors of "Images, Incorporated." Their product is a video/computer system which superimposes a picture of a "client" with one or more computer-stored images of Elizabeth Taylor and Richard Burton, or the Pope, or President Reagan, or in jail with Charles Manson, and produces a composite image which is then printed. The products are intended to be sold at fairs and carnivals. My host's conclusion, arrived at on the basis of a comprehensive market analysis, is that they should sell about \$700 million in such services each year. That is more than twice the total annual archeological market.

My own conclusion is that although the line-printed, composite pictures produced by the Images, Incorporated system are only semi-convincing, they are apparently more so than American archeology. If we could just get 1 or 2 percent of everyone attending fairs or carnivals in the United States each year to spend a couple of dollars on archeology, we would do a lot better than we do now. Another even more basic conclusion that is probably wasted on those of us here today (as it is, effectively, on me), is that if you want to make money, look for a market rather than trying to find one for something you like to do.

To get back to the point, however, we seem to be doing something very wrong in selling and justifying our product as archeologists. Why are we even thinking about preserving archeological sites, in the hope that the archeologist of the future will be able to "use" them and profit in any scientific way from them in the future? Is there in fact a future for archeology as a viable, paid profession and pursuit?

The Future of Archeology and In Situ Preservation

Under the terms of the Archeological and Historic Preservation Act of 1974 (PL 93-291): "whenever any Federal agency finds, or is notified, in writing, by an appropriate historical or archeological authority, that its activities in connection with any Federal construction project or Federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, such agency shall notify the Secretary, in writing; and shall provide the Secretary with appropriate information concerning the project, program, or activity. Such agency may request the Secretary to undertake the recovery, protection, and preservation of such data (including preliminary survey or other investigation as needed, and analysis and publication of the reports resulting from such investigation), or it may, with funds appropriated for such a project, program, or activity, undertake such activities."

The phrase containing the term "significant" in the paragraph above is highlighted because this is an important aspect of such legislation. It is what is left for the agency, in fact for specific personnel in each District or office of the agency, to interpret. The other aspect of management which is left up to the agency or office to interpret is (when a property has been determined significant) how to "recover, protect, or preserve" it.

My prediction is this: that even after a shift in the overall archeological paradigm which would point to landscapes, rather than sites, as a focus of conservation activity, most Federal agencies will continue to focus on "sites" as subjects. This is because if the total (or even a reasonably large part) of the landscape is seen as being "significant," there will be severe repercussions in terms of "holding up" projects which affect large parts of the landscape for which agencies are responsible. For this reason, they will continue--even after the archeological profession in general no longer takes such a view, which may be very soon--to specify very small areas covering only a small proportion of the landscape as being unique, representative, and therefore significant. This has as much to do with agency objectives and the jobs of agency archeologists as it does with archeology as a science.

An additional prediction is that since archeological "treatment"--that is, excavation or other intensive study of sites or areas with significant cultural resources--is very expensive, "protection and preservation" will

become the dominant course chosen by Federal agencies in the fulfillment of their legal responsibilities to the archeological record.

What implications does this have for the future of the "archeological profession"? Specifically, where will the new jobs in archeology be in the next 20 or 30 years? Although site preservation will be increasingly chosen by government cultural resource managers as the least expensive alternative within their purview, as more and more archeological sites are set aside as needing to be "managed," more government cultural resource management "watch-dog" positions will be necessitated.

In addition, there will be an increasing need for site preservation. If today's trend toward the privatization of maintenance of Federal properties continues, and it surely will, more expertise and labor from private sector sources will be required for the specification and conduct of in situ preservation activities. Site preservation is neither simple nor straightforward. Many jobs will be created in this relatively new field. Site preservation encompasses many fields in addition to simple archeology--for instance, botany, geomorphology, and geology, and it is predictable that those whose education and expertise "cross" the boundaries between these fields and archeology will find greater employment in the near future. University programs which emphasize this sort of interdisciplinary theme will increase, to the possible benefit of university programs in general.

The many new sites which may well, in the near future, be preserved "in situ" will also beg the question of what is to be done with those sites by the "archeologist of the future," and this will create a need for theoretically directed archeologists as well. There may only be a need for relatively few such individuals, tens of them if each agency decides they need them, but at relatively elevated salary levels. Within each agency making such a decision, one might expect internal offices to spring up which specialize in applying high technology (and perhaps minimally destructive) procedures, for instance remote sensing or nondestructive site monitoring, to preserved sites. I can only think of a few individuals who could claim such expertise today. This means that not only is there a niche for people to fill, but more of them will very soon be needed by the profession. Neither am I aware of any university programs geared toward producing such individuals; new programs will be called for, and will provide an opportunity for more academic positions as well.

The preceding discussion of the upcoming need for "site preservation oriented" archeologists is based upon my perception of a lag between the

theoretical basis of archeology--which will very soon change from being site oriented to dealing with the continuous distribution of archeological materials across the landscape--with the basis of cultural resource management as perceived by less "theoretically motivated" government policies. Government, after all, is dedicated to maintaining a status quo. Following the change in the emphasis of scientific archeology from a site-based approach to one emphasizing the collection of distributional data across landscapes, however, a shift in government emphasis is at some point inevitable. At this point, which I see beginning now but which will probably culminate within the next 20 years or so, there will be a "new market" for that time's "new archeologists." Thus, archeology should remain a viable career alternative for those oriented in the appropriate directions.

Conclusions and Prospects

I have examined two topics of relevance to archeological site preservation. One of those, the interrelationship between techniques, methods, and theory, is of a very abstract nature, and my conclusions about it are to me, at least, quite encouraging. We will soon have not only the technical means but also the theoretical disposition necessary to preserve complete and accurate information on the distributions of the physical materials which actually make up the archeological record across large portions of the landscape. It is this information -- and not the objects themselves -- in which we are ultimately interested anyway.

As archeological methods and orientations change, particularly in the direction of increased in situ preservation and the need to use those preserved materials in the service of the profession, new jobs will be created.

On the other hand, in order to do this we are going to actually have to do something. And doing something is going to cost a lot more than archeology and cultural resource management have in the past. This is the discouraging aspect of my discussion, because as I have outlined above, I do not think we presently have any sort of adequate economic base with which to actually accomplish much. In order to increase our economic base, we need something to sell. The most optimistic way I can think of to approach this quandary is to hope that we already have something to sell, but just do not know what it is. Another way of putting this is that we need to find a "market" and fill it with what we have. I do not profess to know how to do this, but I think it

will probably involve the thorough examination of what archeology is doing, and what it is "worth" in societal terms, in a very realistic way. We must be "introspective," not in a deterministic or a structuralist or any other "theoretical" manner, but in terms of what archeology does and means in a systemic context.

What is it that makes people interested in archeology? When I go to parties, and people ask me what I do for a living, they are almost always envious. They say they always wanted to be an archeologist, but their parents would not have paid for their college costs if they had chosen that course of study. What is it about archeology that captures the imagination of virtually everyone in our society? I am not completely sure, but I think it has to do with our not wanting to feel that we are alone. Archeology and the information we elucidate about how people in the past did things that we can in some sense identify with constitutes as great a source of entertainment as spectator sports or driving at high speed in cars and shooting at road signs.

I am not sure why this should be the case, but we are going to have to capitalize on this almost universal perception in order to fund our work. Rather than simply writing uninteresting research reports, and often hiding these from the "public" so they will not find out the locations of sites, we are probably going to have to increase the exposure of our science, making its findings ever more available to the citizenry at large, in order to justify public expenditure for site preservation and the other activities which support us.

There might be better ways to increase public participation in archeological activities. Almost all Americans are involved in nonparticipant appreciation of team sports; they do not have to play football or hockey to appreciate and promote them. What we need is sponsors and advertisers, and what we need in order to get those is some kind of argument about our science's entertainment and educational value, and especially the market that these aspects of the science has. Having been directed in a somewhat different direction, to think that what we want to do is "research" all the time, we have not been educated in these promotional aspects of archeology.

Archeology may well be in need of some applied anthropology -- particularly in an economic sense, and the sooner the better. In recent months, I have met many archeologists and anthropologists who have taken up the business aspects of the field. This is a whole employment niche in itself. It is being filled now and comprises the areas of archeological law, archeological

method, archeological theory, and something else -- archeological promotion. I hope that for many of you readers this is an acceptable career alternative, because not only do we need you, but you need us. We can work together.

Archeological Site Protection and Preservation in a Wilderness Setting

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Bureau of Land Management

Introduction

Until very recently, archeologists have assumed that wilderness designation immediately offers greater protection to cultural resources than those public lands open to multiple-resource management. After all, ground disturbing activities and their associated indirect impacts would be eliminated. While this is true, concerns have been raised that literal interpretations of the Wilderness Act of 1964 and the Bureau of Land Management's (BLM) national wilderness policy could prevent effective management and conservation of archeological remains. In New Mexico, the BLM recently released a detailed manual supplement on how cultural resources will be managed within designated wilderness areas (New Mexico Bureau of Land Management 1989). Policies enumerated within this manual represent compromises between the wilderness and cultural resource programs. These compromises will affect how archeological research is carried out within wilderness areas in New Mexico. The archeological profession should be aware of how these policies will affect planned research within wilderness areas since other Federal agencies may well adopt similar measures. Other BLM states and agencies have indicated an interest in adapting this manual to their local conditions.

Good Guys Versus Good Guys

Wilderness management basically seeks to insure the preservation of natural ecological processes over the long term. Archeologists favor the wise conservation of their limited non-renewable resources. While this frequently results in the preservation of archeological sites, our conservation philosophy recognizes that valid research questions can justify the study and consumption of archeological sites in order to answer important questions about human behavior.

The Wilderness Act

Not surprisingly, the Wilderness Act is silent on the specific question of the management of archeological resources. It mentions that a valid use of wilderness is for scientific purposes while prohibiting motor vehicles, motorized equipment, and structures, except as necessary for minimum administrative requirements.

The BLM Management Policy

In September 1981, the BLM issued a national Wilderness Management Policy (US Government Bureau of Land Management 1981). Within this 36-page booklet are found guidelines for specific activities. Regarding cultural and paleontological resources, the policy states that:

In most instances, these resources will be subject to the forces of nature in the same manner as other wilderness resources. Study or management will not normally include any excavation, stabilization, or interpretation activities. However, intensive inventories, salvage, rehabilitation, stabilization, reconstruction, and restoration work may be permitted by the State Director where the project will not degrade the wilderness character of the area and such activity is needed to preserve the particular resource.

Cultural Resource Management (CRM) Legal Mandates

Unlike some other programs affected by wilderness designation, CRM's legal mandate is very broad indeed. It is not necessary to review in detail all the various acts driving CRM in the Federal government. We should be aware, however, that none of these major pieces of legislation distinguish between wilderness and non-wilderness lands.

The most relevant pieces of legislation include:

- a. The Federal Land Policy and Management Act of 1976. It declares that public lands shall be managed in a manner that will protect the quality of scientific and archeological values.
- b. The National Environmental Policy Act of 1969. It states that part of the government's function in protecting the environment is to preserve important historical and cultural aspects of our national heritage.
- c. The Historic Sites Act of 1935. This authorizes the Secretary of the Interior to conduct surveys and to investigate sites to obtain accurate information about them.

- d. The Archeological Resources Protection Act of 1979 as amended in 1988. This requires the BLM to prepare plans for surveying land most likely to contain the most scientifically valuable archeological sites.
- e. The National Historic Preservation Act of 1966 as amended. This Act, of course, requires us to inventory and nominate eligible properties to the National Register of Historic Places. Importantly, the 1980 Section 110 amendments specify that each Federal agency must exercise caution to assure that any property that might qualify for inclusion is not inadvertently demolished, substantially altered, or allowed to deteriorate significantly.

Conflicts Between These Different Sets of Legal Mandates

Several papers have already explored the conflicting objectives of archeologists and wilderness specialists. I refer you to Neumann and Reinburg's paper entitled "Cultural Resources and Wilderness: The Good Guys Versus the Good Guys" (1988) and Berger, Overbaugh, and Stankey's "Extraction of Non-Renewable Resources From Wilderness: A Dilemma of Scientific Use" (1987).

Neumann and Reinburg correctly point out that the major issues emerging in this area are:

- a. Whether or not designation of a wilderness area in and of itself constitutes an adverse effect on cultural resources and requires compliance with Section 106 of the National Historic Preservation Act, especially if stabilization of sites is not allowed within wilderness areas.
- b. Whether the various activities associated with a CRM program, such as inventory, stabilization, field schools, research, monitoring, and patrolling, add to, conflict with, or detract from wilderness.

Berger, Overbaugh, and Stankey raise numerous rhetorical questions which seem to imply that managers must choose between the loss of scientific knowledge or the loss of wilderness values. They ask, "...does the wilderness manager allow destruction of potentially significant scientific data for wilderness preservation? Or does the manager allow the removal of...cultural material for preservation of scientific knowledge at the expense of wilderness values?" (Berger, Overbaugh, and Stankey 1987, p 4). Their position regarding scientific research is typical of those who regard wilderness, a uniquely political creation, as a resource unto itself. They posit that "The act of collecting finite resources, such as...artifacts is by and large unmitigatable since specimens are removed from the total context of the natural ecological

processes... Wilderness character and natural ecological processes have been tampered with." (Berger, Overbaugh, and Stankey 1987, p 4). Pressures are being brought to bear on Federal land managers to deny research proposals within wilderness areas under the hope that "...technological advances in the foreseeable future (will) allow gathering of scientific data without physical removal of the ...artifact from its ecological context" (Berger, Overbaugh, and Stankey 1987, p 4).

Resolving the Conflict

Professional archeologists must participate in this debate since its resolution will affect field projects within wilderness areas in the years ahead. Currently, there are over 25.6 million acres designated as wilderness study areas throughout the western United States on BLM lands. This represents the largest remaining block of Federal land now being considered for inclusion in the national wilderness system. These acres contain archeological sites crucial to the study of adaptation and cultural evolution.

The remainder of this paper will discuss in some detail the New Mexico BLM Manual Supplement on cultural resources management within wilderness areas (New Mexico Bureau of Land Management 1989). Its implementation will affect archeological research, protection, and preservation throughout New Mexico's wilderness areas in the years ahead.

Inventory

First, surveying within wilderness areas will be examined. In the context of carrying out surveys, collecting samples of artifacts, augering, and troweling will be permitted. Subsurface augering and troweling during a survey will be limited to a total surface disturbance of 1 sq m or less per site since they should be directed at determining the significance of the site and its eligibility to the National Register of Historic Places.

Collections of surface artifacts will be limited to diagnostic artifacts or representative samples. We will urge that these samples be kept to a minimum. The use of motorized vehicles will not be allowed within wilderness areas and a wilderness-specific permit will be required.

Protection

The monitoring and patrolling of archeological sites will generally be carried out by agency archeologists supplemented by volunteers. In cases of "hot pursuit," law enforcement personnel will be authorized to use mechanized equipment or motorized transport to apprehend suspects. Two of our wilderness areas, the Cebolla and the West Malpais, created with the establishment of the El Malpais National Conservation Area, have been the scene of intensive looting and vandalism. We intend to initiate long-term systematic monitoring and patrolling of sites within these new wilderness areas to determine if designation leads to a decrease in illegal digging. The public perception that wilderness designation necessarily results in increased law enforcement presence may benefit cultural resource protection. In any event, the use of wilderness patrols, increased signing, and prohibitions of vehicle entry will assist us in safeguarding the dramatic Pueblo III ruins so abundant in this area.

Stabilization

The most obvious example of conflict between cultural resources management and strict wilderness preservation concerns site stabilization. Some Federal agencies instituted policies requiring that old historic lookouts or administrative buildings be allowed to weather and deteriorate naturally. Others simply tore down or burned historic structures. While most BLM wilderness areas in New Mexico do not contain early lookouts or ranger cabins, they may include homesteads or, more frequently, large prehistoric pueblos with intact standing masonry walls rising to over a meter in height.

Much confusion has arisen from the fact that within the definition of wilderness contained in the 1964 Wilderness Act, it is stated that "A wilderness...is hereby recognized as an area where the earth and its community of life are uncramped by man...without permanent improvements or human habitation, which is protected and managed, as to preserve its natural conditions and which...generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable..." (US Government 1964).

Wilderness "purists" have seized upon this language to tear down structures or to abrogate affirmative management of cultural resources in

accordance with the National Historic Preservation Act. In some instances, compromises have been reached as a result of statutory language. The 1980 Central Idaho Wilderness Act required the preparation of a study to determine which cabins and structures should be stabilized, restored, maintained, or removed. However, it is extremely difficult for special language of this nature to survive the legislative process.

And, indeed, why do we need it? As I have already mentioned, the 1980 amendments to the National Historic Preservation Act direct each agency to protect the architectural qualities of its significant sites.

The National Historic Preservation Act applies to all Federal lands, including wilderness areas. So far, however, no case law has established the primacy of the National Historic Preservation Act or the Wilderness Act regarding the issue of site maintenance.

Our New Mexico policy on stabilization recognizes that because it is so expensive, stabilization will only be carried out on highly significant sites that have no real chance of survival without treatment. Bringing in equipment and personnel to stabilize a site will temporarily affect both the wilderness environment itself as well as the desired recreational experience of solitude and primitiveness. Our priority will be to minimize the more lasting environmental impacts such as soil disturbance, discharge of any chemicals, disposal of trash, or removal of vegetation. To accomplish this, we are willing to accept logistical arrangements and field methods which may temporarily disturb the recreating public, especially if these will result in fewer long-term disturbances to the immediate site environment. Nevertheless, every effort will be made to stage outside the wilderness area all possible related activities such as material and water procurement, lodging, equipment and tool caches, and material staging areas.

Data Recovery

Restrictions and regulations affecting data recovery at sites within designated wilderness areas are perhaps of more immediate concern to the archeological community. We include within data recovery in-field analyses, instrument mapping, surface collection, test excavation, and full-scale excavation. It is acknowledged that permanent datums will have to be established within wilderness areas. While these may consist of metal stakes secured by cement, they should be as inconspicuous as possible. In-field

analysis will be strongly encouraged to minimize the need to remove artifacts from the wilderness for laboratory inspection. However, artifact removal will be allowed to continue in accordance with a sound research design. It will be much more difficult to receive authorization for the use of backhoes, graders, motorized pumps, gasoline motors, or other motorized equipment. Permission to use such devices will only be given by the State Director if they can be justified as the "minimum tools" necessary. In other words, you will have to demonstrate that there are no feasible alternatives to accomplish your research design other than the use of such equipment.

Because cultural resources within wilderness areas are better protected from land-disturbing activities than lands available for multiple use, the BLM's overall philosophy is to maintain present site conditions so that they will be available for future scientific investigations. This policy will restrain, but not entirely prohibit, data recovery.

One of the situations where data recovery may be approved is when cultural resources are in imminent danger of destruction from human or natural causes and stabilization is not feasible. In these cases, salvage excavations may be authorized. Particularly when the cultural resource values are high and when the threat to those resources is severe, the use of motorized vehicles or equipment may be justifiable as the minimum tool necessary. If the local BLM Area Manager decides that delay would result in the loss or destruction of critical cultural resources, the Area Manager can authorize emergency data recovery, including use of motorized equipment as the minimum tool necessary to complete the salvage.

Excavations also arise in connection with university-sponsored or grant-funded research. Detailed research designs must be submitted in conjunction with site-specific permit applications. Agencies encourage research that does not involve disturbance or removal of cultural resources. When research proposals involve collection or excavation, the BLM may get back to you and ask whether other sites outside of the wilderness, which are already threatened by human or natural causes, could provide comparable data. Remember that when you draft a research design that proposes collection or excavation within a wilderness area, a thorough justification must be presented which demonstrates that critical research issues will be addressed and that those research issues cannot effectively be pursued using resources in non-wilderness settings.

Except in emergency situations, data recovery proposals will be analyzed through an environmental assessment. Stipulations designed to minimize the

impact of data recovery on other wilderness values may be imposed. These might cover such topics as reclamations measures, timely backfilling, camping or access restrictions, topsoil treatment, replacement of a sample of artifacts, etc. As part of the environmental assessment, the data recovery plan will be subject to a minimum 30-day public notification and comment period.

Interpretation and Signing

Finally, we should consider the interpretation and signing of archeological sites within wilderness areas. Interpretation of cultural resources within wilderness areas will take place primarily off-site and outside the wilderness at entry points and trail heads. Only after sufficient data recovery has occurred to reduce the potential impacts from increased visitor use will sites be signed and interpreted within the wilderness. Stable, low-visibility sites, away from higher traffic visitor areas, will not be signed. In contrast, high-visibility sites, subject to pothunting, or in high traffic areas may warrant protective signing.

Conclusions

The New Mexico Manual Supplement on Cultural Resources Management Within Wilderness Areas will ensure that individual wilderness management plans treat cultural resources management consistently. In New Mexico alone, some 51 individual wilderness study areas will receive wilderness status when our statewide wilderness legislation passes Congress during the next session. This will affect 930,000 acres. The archeological profession needs to get involved in the formulation and review of individual wilderness management plans as they affect archeological resources.

It does not appear that the BLM is about to be inundated with numerous requests to carry out archeological research within wilderness areas. Nevertheless, wilderness designation will affect your ability to carry out research along the lines I have indicated. Any deadlines for securing grant or university funding that are dependent upon securing a Federal permit must take agency policies such as I have been discussing into account.

The Bureau's ability to initiate surveys and to stabilize sites will continue to be limited. It will continue to be more cost-effective to concentrate those efforts outside of designated wilderness areas. However, there

are two principal arenas where the active management of cultural resources is most likely to occur within wildernesses. The first concerns emergency site stabilization to protect resources from erosion or weathering. The effects of down-cutting arroyos or the imminent collapse of standing masonry walls may force us to take remedial action. The second involves the need to record site conditions accurately enough to document looting or vandalism in violation of the Archeological Resources Protection Act (ARPA). ARPA enforcement is finally receiving stronger emphasis by US Attorney's Offices and, at least in New Mexico, is being closely watched by the Congressional delegation. It is unrealistic to think that all pothunter activity will cease simply because a site now falls within a wilderness area. Therefore, thorough documentation of site conditions including recording, testing, patrolling, and monitoring will likely be emphasized in the future.

Archeologists generally seek to conserve their resource base for as long as possible, until such time as consumptive research can be justified. Most archeologists recognize that the greatest threat to cultural resources stems from land development and the indirect effects associated with it. Therefore, the designation of wilderness areas and the attendant protection afforded archeological sites within should still be seen as a good thing.

Cultural resources management within wilderness areas must be governed by reasonableness and common sense. The Wilderness Act and the various specific wilderness bills which followed are important pieces of legislation. However, archeologists can also point to a dozen major laws and regulations governing their program. These various legal mandates can be made compatible only if both sides accept logistical and methodological constraints on management and research that achieve stated objectives without degrading overall wilderness values.

Until case law develops to clarify the priority of these different laws, Federal agencies will be left with the unenviable task of resolving these issues themselves. I would urge you to get involved at the local, state, or national level to insure that evolving agency policies and wilderness management plans reflect your concerns and needs.

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Innovative Management of Privately Owned
Archeological Preserves

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Preserving and managing archeological sites on private land pose special problems and offer unique opportunities for innovation. As development pressures increase in areas where sites are prolific, the challenge facing the preservation planner is to preserve sites without hindering development. That challenge can often be met by designating sites as open space. Sites can also be preserved within golf courses and recreational areas. Protection and management of private preserves can become a community issue involving volunteers as well as homeowner's associations. This paper addresses the management and protection needs of privately held archeological preserves and explores innovative preservation solutions.

The importance of establishing a nationwide network of archeological preserves on private land is critical to the future of our profession. With the rapid increase in professional looting, increased development pressure and the expansion of farmland, America is losing archeological sites at a faster pace today than at any time in the past. It will just be a matter of time until the only intact archeological sites available for research will be those that have been systematically protected as preserves.

Responsible "conservation archeology" calls for a well-managed data bank of unexcavated archeological sites to be readily available for future generations of researchers to tap. Many well-conceived, adequately funded research efforts have been scrapped or suspended because of a change in land ownership. Long-term research projects need a firmer foundation. Even the most receptive landowner can face a foreclosure and stop a project.

Although a significant number of sites are currently protected on public lands by law, most important sites are privately owned. Most of the prehistoric habitation of what is now the United States took place along water courses and near arable lands. These are the same areas that early homesteaders claimed first. In the West most of the Federal land consists of what was left over after the more desirable lands were claimed. As a result, without a private preservation initiative, the nation's site preservation program would contain significant gaps, especially in some culture areas.

Over the past 10 years, The Archeological Conservancy has been actively pursuing the systematic acquisition of archeological preserves with a great deal of success. We now have established 58 preserves in 11 states and are pursuing many more. We are the only organization in the United States currently involved in the full-time activity of establishing archeological preserves.

The concept for a permanent archeological preserve begins with control of the surface of the property, either through fee simple ownership or the use of a conservation easement. Many State and Federal agencies have used cooperative agreements with private landowners as a preservation tool. Landmark programs have also been widely used in some states to extend protection to private land. Unfortunately, many of these programs offer only temporary protection, since many of the agreements can be terminated by the landowner. Although it can be argued that these programs focus a greater degree of landowner interest in protecting sites, I feel that they should only be employed as a mechanism leading to permanent preservation.

Ownership or control of the mineral estate under an archeological site is not as critical in protecting the resource. Although mineral rights are considered "dominant" rights over surface interests, landowners are entitled to receive surface damages for any mining activities. An aggressive surface owner can insist on damages that would include the cost of completely excavating areas of the preserve that might be impacted.

Ownership or control of the surface is just the first step. Preservation goals cannot be accomplished without an active management program addressing security, professional access, and a long-term plan for managing the "data bank." The Archaeological Conservancy, with the assistance of a local "Management Committee" develops a 100-year plan for each preserve. The committee addresses erosion control, ground cover, and professional access. Our preserves are patrolled by volunteer "site guards" who know to call our office if they see unauthorized activity on the preserves. We often work with neighborhood groups and homeowner's associations to help with planning and site security. Once community members gain a sense of collective pride in their association with the preserve, they identify with the role the site played in local history, and protect it from vandalism.

Selecting which sites to preserve is an important process. Not all sites are good candidates. With the assistance of State Historic Preservation Officers and local archeologists, the Conservancy has developed priority lists

for each state we operate in. We do not consider sites that have been badly damaged, or sites that we feel would be too difficult to protect.

Most of the sites we have obtained have been partial or total donations to the organization. Where we have had to purchase a site, we have funded the purchase through grants from foundations and corporations.

In the face of increased development pressure, we must meet the challenge of achieving preservation goals without interfering in the development process (Figure 1). In compliance matters, this is often easy. Preservation of a site is usually less expensive than excavation.



Figure 1. Thoeny Pueblo, Arizona. This 14th century Sinagua culture ruin is in the heart of the planned community of Lake Montezuma. The lake and golf course are in the background. The Conservancy acquired the site in 1986

One important factor is to develop an adaptive use for the preserve where possible. A fenced-in, weed-covered acre in the middle of a posh subdivision not only represents an eyesore, but it also invites vandalism.

Even in rural areas, archeological preserves are easier to establish and maintain if they have an established alternative use that is compatible with preservation. Here are a few examples of multiple use of preserves that we maintain:

Cabe Mounds, near Texarkana, TX (Figure 2): This eight-mound Caddo ceremonial complex covering about 60 acres is used to as an active pecan orchard and for cattle grazing. The conservation easement we hold protecting the property allows both uses and contains details protecting the mounds, such as what happens when a tree needs to be replaced (we agree to archeologically excavate the hole).



Figure 2. Horace C. Cabe Mounds, Bowie County, Texas. This 50-acre archeological preserve contains a Caddo ceremonial mound complex (eight mounds total). It is protected by a conservation easement donated by Horace C. Cabe to the Archaeological Conservancy in 1986. The mounds are located in an active pecan orchard

We cut hay (but don't allow plowing) on many of our preserves. We have several of our rural preserves (those without standing walls) leased out for grazing, often to the former owners.

Especially with rural preserves, multiple use usually means that a farmer or rancher regularly visits the preserve to tend his crop or check on livestock. The more watchful eyes that are focused on an archeological site, the less likely it will be disturbed.

In urban areas, where land use is intensive and the success or failure of a development project hinges on the number of developable square feet available, establishing a preserve can present more of a challenge.

* A table of factors for converting non-SI units of measurement to SI (metric) is provided on page 4.

One technique is to use the preserve to satisfy the open space needs of the development. Most developments have specific open space requirements, and if archeological sites (worthy of preservation) can be identified early enough in the planning process, they can often be designated as open space.

To facilitate site preservation, it helps to have a mechanism in place to transfer development densities lost in site preservation to other areas of the development or to other projects. This transfer of densities was used recently in Albuquerque to preserve 17 acres of a large pueblo on the West Mesa within a 100-acre development. In exchange for excluding development on the 17-acre tract, which the city eventually bought, the developer was allowed a slightly higher density on the remaining 83 acres. This zoning technique of density transfer can often be tied to a local zoning ordinance protecting sites from development or destruction.

With urban preserves, the open space should be useful space, where possible, and not just a vacant area set aside. Examples include incorporating the site into a golf course. This has been done with limited success at the Newark Works site (Figure 3) owned by the Ohio Historical Society in Ohio. Similarly, a Mayan ruin is located in the middle of a course on the island of Cancun on the Yucatan Peninsula.



Figure 3. Newark Works site, Ohio. This prehistoric mound site has been incorporated within a golf course

Any adaptive use of an archeological preserve must consider potential impacts to the resources. As an example, it may be necessary to place a layer of clay topped with sod over a site to protect it from people walking over it on a golf course.

Another innovative example of using preserves within a development comes from Cass County in Minnesota where a developer preserved a series of Middle Woodland burial mounds in conjunction with a condominium development and constructed a walkway and an observation deck for residents to use and appreciate the space. This type of adaptive use could later lead to a more formalized interpretation of the site.

Another example of innovation is a proposal to build a high-rise building in downtown Tucson on pilasters leaving a portion of the Presidio underneath the building to be preserved for later study and public interpretation.

Through creative land use planning, archeological sites can be preserved by incorporating them into development plans. Preserves create opportunities, both for future research and eventual public interpretation. As a profession, we need to get the message across to developers and landowners that a well-planned, well-managed preserve can enhance the use of surrounding land.

Archeologists should also work with land use planners to develop creative and effective land uses for archeological preserves. In addition to The Archaeological Conservancy's national effort, we would like to encourage more universities, historical societies, and museums to establish and manage archeological preserves on a local level. Unless we can preserve a sample of what is left of the data bank, the future of our profession will remain in doubt.

Research Orientations for Preserving Archeological Properties
at Corps of Engineers' Water Resources Projects

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Introduction

Two of the many terms that became fixtures in the archeological lexicon during the 1970's were "cultural resource management" and "conservation archeology." Cultural resource management arrived on the scene, supported by a cast of Federal, State, and even local rules and regulations, and is a still-evolving, multidimensional concept, incorporating a wide variety of strategies and techniques employed to manage and protect cultural resources. These activities include the use, protection, preservation, and investigation of properties, and may even include decisions not to preserve certain properties.

In the mid 1970's, the idea of conserving elements of the archeological record for the future was also advanced, championed primarily in a thought-provoking article by William Lipe (1974) outlining a model for resource conservation. Lipe's argument centered on the desirability of saving archeological sites in place whenever possible as opposed to excavating them and thereby promoting the removal of another piece of a rapidly disappearing resource base. The conservation approach is based on a philosophy stressing protection, preservation, and/or managed use of cultural resources for future generations, and emphasizes protection of representative sites and preservation of data through scientific study. This approach contrasts with an earlier "salvage ethic" which stressed the immediate recovery of cultural material from threatened sites (McGimsey and Davis 1977, pp 109-110). Invoking a conservation ethic does not, as some believe, rule out research-oriented excavation as an option. As Lipe noted "we must, of course, continue to excavate enough to pursue the problems raised by the discipline and to keep the field intellectually healthy."

The approach taken in this paper is that in situ preservation should be considered equally with other options in each case where a significant resource is facing impending loss of its integrity. Providing that the site is amenable to preservation, a suitable preservation technology is available, and monitoring/maintenance of the technology is possible, then the preservation option is viewed as the best course of action.

As we are all aware, a myriad of threatening forces exist today for cultural resource properties throughout the country, including stresses caused by human intervention (e.g., vandalism, tourism, construction, recreation, etc.) and the ongoing processes of natural erosion and materials degradation. If we are to effectively combat the loss of this resource and provide proper long-term preservation, suitable strategies and technologies must be identified and tested which will aid us in achieving the goal of effective management and stewardship of the resource base.

A series of workshops sponsored by the US Congress, Office of Technology Assessment (OTA) generally concluded that suitable preservation technologies for the purpose of providing in situ preservation are not well-known or developed, at least by those specialists most directly involved in archeological sites preservation. According to the OTA report (US Congress, Office of Technology Assessment 1986, p 9), the following points characterize this discrepancy:

- a. In many instances, technologies appropriate to archeological site preservation have been developed for use in other disciplines, such as the natural science and engineering fields, and, consequently, have not been successfully adapted to preservation needs.
- b. Efficient transfer of technology developed in other disciplines is impeded by archeologists' frequent lack of familiarity with the natural sciences and engineering.
- c. There has been a general lack of formalized interdisciplinary approaches to archeological preservation problems.
- d. At the same time, many natural scientists and engineers are unfamiliar with the needs and goals of archeological preservation.

In order to close this gap, the OTA report recommended a number of necessary actions, including: (a) training in the use of technologies; (b) studying ways to apply known technologies to archeological preservation problems; (c) improving information sharing and coordination; (d) finding the appropriate fit of technologies to preservation problems; (e) reducing costs of new technologies; and (f) developing standards for the application of new technologies.

This paper focuses on the issues highlighted by the OTA workshops and documents the efforts of one agency, the US Army Corps of Engineers, to address the need for research and development of preservation technologies for archeological sites and successful transfer of the technology. The research effort described herein is unique in its scope and purposes and, while it is

specifically oriented toward site preservation requirements of the Corps of Engineers, it provides benefits for other agencies concerned with the preservation of cultural resource properties.

Site Preservation in the Corps of Engineers

The US Army Corps of Engineers is a complex organization with multiple responsibilities requiring extensive design, engineering, and construction expertise. Nationwide, the Corps provides support for some 24 million acres, split about in half between military and civil works holdings. While the military mission of the Corps is significant, our concern here is with the civil works or water resources program which includes almost 1,500 projects across the country. In this program, the Corps is responsible for a wide variety of activities, including the planning, design, construction, operation, and maintenance of projects for flood control, navigation, hydroelectric power, water supply for municipalities and industry, recreation, fish and wildlife management, and environmental enhancement. Since passage of the Flood Control Act in 1936, the Corps has constructed more than 400 flood control dams and thousands of miles of levees. In the civil works projects, there are some 52,000 miles of shorelines. Additionally, the Corps manages more than 2,000 separate recreation areas at 463 water resource development projects in 41 states.

Research to support the Corps' military and civil works missions is conducted at four major research centers, including the Construction Engineering Research Laboratory in Champaign, IL, the Engineer Topographic Laboratory at Fort Belvoir, VA, the Cold Regions Research and Engineering Laboratory in Hanover, NH, and the Waterways Experiment Station (WES) in Vicksburg, MS. The largest of these centers is WES, which pursues a wide spectrum of research activities in six component technical laboratories: Hydraulics, Coastal, Geotechnical, Structures, Environmental, and Information Technology.

As might be expected, there is considerable potential for adverse impacts to significant cultural resource sites on lands either owned or managed by the Corps. This situation includes threats from a wide range of agents: e.g., erosion, both surface and shoreline (reservoir, coastal, and waterway), stabilization and rectification of rivers, maintenance activities such as dredging of navigable waterways and harbors, intentional and

unintentional site burial (by both earth and inundation), and vandalism associated with recreational usage of Corps' lands.

In addition to meeting the requirements contained in assorted general historic preservation laws, the Corps has issued policy statements through its own regulatory channels regarding protection and preservation of cultural resource sites, and values its lands. Primary policy statements are found in Engineer Regulations 1105-2-100 and 1130-2-438 (US Army Corps of Engineers 1990, 1987) and in Dredging Guidance Letter 89-01 (US Army Corps of Engineers 1989).

The overall policy of the Corps of Engineers with respect to the preservation of cultural resource properties can be summarized as follows (Thorne, Fay, and Hester 1987):

- a. The information contained within cultural resource properties lies within the public interest as defined by legislation.
- b. The Corps has responsibility for the cultural resource properties on the land it owns or manages.
- c. The preservation of cultural information in situ is an alternative management option to data recovery through excavation.
- d. Costs of such preservation activities are specifically authorized by legislation and regulations.
- e. Such cultural resource properties to be preserved should be "significant," i.e., listed on the National Register of Historic Places or "eligible" for such listing.

Site Preservation Research

Three separate but interrelated themes are evident in the preceding paragraphs. These include the agency's mission, its impacts on cultural resource properties, and the agency's policy regarding preservation of the resource base. Recognizing its responsibilities in this context, the Corps of Engineers held a workshop in 1984 to examine the state of the Corps' site preservation program and to assess the need for research and development in this area. Among the conclusions reached at the workshop, its organizer, Roger Saucier, summarized the following as being most important (Saucier 1984):

- a. Site preservation can be an acceptable, effective, and practical cultural resources management option.
- b. Despite a continuing downward trend in the authorization of new Federal water resources development projects, there is an

increasing upward trend in the need for site preservation at existing projects.

- c. Much relevant information on site preservation technology exists, but it is in the literature of numerous disciplines and most of it is not readily accessible to or understandable by archeologists.
- d. Most applications of conventional techniques for erosion control have not involved archeological sites, so little is known about possible side effects on sites.
- e. There have been a few documented examples of successful site preservation, but with a few notable exceptions, they appear to have been the outcome of trial and error and good luck more than effective planning.
- f. There is as much a need for research and development assistance in developing planning and management techniques as there is in the production of hard technical data.
- g. There is a critical need for the more timely and effective dissemination of information between agencies but especially within the Corps of Engineers itself.

As an aside, while there have been important steps taken in the past few years toward improving the deficiencies outlined in these conclusions, the needs outlined by Dr. Saucier 6 years ago are still very much with us today.

Based on the information generated by the workshop, the Corps of Engineers initiated a multiyear research program to look at the overall concept of in situ preservation of archeological resources as a viable management option. In prior practice, cultural resource management has been narrowly defined to include primarily two forms of impact reduction at archeological sites--data recovery through excavation and site protection by means of changing project design to avoid sites. The thesis of the current research effort is that a third alternative, site preservation through protective strategies, is preferable to either excavation or avoidance. In situ protection may in fact be more cost-effective and, over the long term, it supports the tenets of the conservation approach. Data recovery is, of course, a useful mitigative measure; however, it should only be undertaken when it clearly is the best course of action. Site avoidance, on the other hand, provides short-term protection for the resource, but it does nothing to ensure preservation over the long run since erosion and other deleterious forces will continue to operate. Simple avoidance as part of project planning and construction may even contribute to long-term resource loss as pressures from secondary or indirect impacts increase due to the proximity of the operating project.

In that the Corps manages few prehistoric structural sites and such research is ongoing by other agencies, primarily in the American Southwest, a decision was made at the outset to exclude standing masonry or adobe resource properties from the research effort. Likewise, preservation technologies associated with historic structural sites were not included. Although technologies normally associated with these types of sites have not been examined by the research program, many of the management guidelines and strategies evaluated, as well as studies designed to identify and predict impacts, will likely be useful in the broader cultural resource management context.

The research effort, entitled "Field Preservation of Cultural Sites," began in 1985 under the auspices of the Environmental Impact Research Program (EIRP) at WES. The EIRP is managed within the Environmental Laboratory at WES and is one of several major Corps of Engineers research programs located at WES which support the Corps' overall mission.

Operating under the basic premise that research is needed to identify and test suitable preservation technologies which can be implemented to conserve cultural sites, work has been undertaken within four broadly defined categories. These include: (a) planning and management guidelines and strategies for site preservation; (b) technical guidance and specifications for preservation alternatives; (c) monitoring or verification strategies to assess long-term effectiveness of the technology; and (d) transfer of existing and newly developed technology for site preservation. Within this framework, several approaches have been designed to provide the desired products, including compilation of existing technology from several fields, development of predictive models for processes leading to site destruction, and field tests and demonstration projects. Dissemination of the technology involves transferring information through a variety of media including technical reports, journal articles, databases, workshops, bibliographies, technical notes, and a video. In addition, technical assistance has been provided to Corps offices and other Federal agencies as well as state and local offices and private industry.

It is not possible or necessary at this point to elaborate on all of the research avenues and products which have been completed or are in progress as part of the research program. However, it may be informative to briefly review three of the seemingly more important efforts to give an idea of the breadth of the work. Two of these examples are based on field/laboratory research projects and the other is in the area of technology transfer.

Site Burial Research

The idea of burying archeological sites with a sterile protective capping is not a new one and, in fact, is probably more commonly practiced than thought by many. Legitimate objections can be raised regarding unknown side effects which may occur during the burial process and in the long term, and the issue of future accessibility is of concern. There is very little previous research in this area to help us identify the positive and negative aspects of such an undertaking.

Beginning with an interdisciplinary workshop to evaluate the various physical, chemical, and biological processes affecting archeological sites (Mathewson 1989), Corps-sponsored research undertaken by Texas A&M University has progressed to field research on site burial effects (Mathewson, Gonzalez, and Eblin, in preparation). The field research included two phases of work. The first undertook comparison of natural soils buried under engineered embankments (e.g., levees or abandoned railroad grades) and adjacent unburied soils to evaluate their physical, morphological, and chemical properties. The second phase involved field testing of various construction and burial techniques on modern "archeological materials" to evaluate the effectiveness of different protective covers. The field tests were conducted at the Texas A&M Construction School and concluded with the excavation of the "artifacts" and assessment of the degree of damage in each case. Generally speaking, this research has made significant progress in helping us to evaluate whether or not site burial is appropriate in a given case.

Predictive Modeling of Reservoir Bank Erosion

Reservoir shoreline erosion of archeological sites is one of the greatest problems facing cultural resource managers and specialists in the Corps. Under contract to the research program, Ebert and Associates (Ebert, Camilli, and Wandsnider 1989) investigated the use of sequential historical aerial photographs for estimating the rate of erosion at sites located on the shorelines of several Corps reservoirs in the middle Missouri River region. Regression analysis was used to arrive at site-area decay curves from which predicted extinction dates for selected sites could be determined. This information can be used to program future protection needs.

Archeological Sites Protection and Preservation Notebook (ASPPN)

The initial issue of the ASPPN (US Army Corps of Engineers 1990) appeared in late 1988 to provide an avenue for the dissemination of information related to various topics associated with site protection and preservation. Topical categories covered in the notebook include: (a) impacts; (b) site burial; (c) structural stabilization; (d) soil and rock stabilization; (e) vegetative stabilization; (f) camouflage and diversionary tactics; (g) site surveillance; (h) stabilization of existing structures; (i) faunal and floral control; (j) signs; and (k) inundation. Technical notes are issued periodically for inclusion in the notebook to include the summarized results of two forms of inquiry: original research conducted under the EIRP research project and accounts abstracted from published and unpublished site preservation reports from around the country. The ASPPN serves as a primary sourcebook for individuals and agencies concerned with the management and preservation of archeological sites.

Conclusions

Effective and long-lasting archeological preservation requires a commitment to identify, evaluate, and test various alternative strategies and technologies. Faced with the realization that significant cultural resource properties and data are being lost at a greater rate than need be the case, the Corps of Engineers has initiated research to find ways to improve and enhance its management responsibilities in this regard. To date, this research has shown that cost-effective site preservation can be attained, although there is still much to be learned about topics such as which sites should be protected, how to accurately predict various erosion impacts, and how to select and apply the most practical preservation technology in a given situation. Also needed are data on the long-term effectiveness and consequences of preservation technology applications and the best way to accumulate this information is to initiate long-range monitoring of the technologies. Moreover, the Corps and other agencies also need to assess the roles that their own planning and operational activities play in working against meaningful site preservation.

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From Water Development to Environmental Management,
the Bureau of Reclamation's Changing Role

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Introduction

The invitation to participate in this symposium triggered a quick survey of the Bureau of Reclamation's efforts at specific archeological site preservation and protection. The results confirmed what I already suspected. Efforts, for the most part, are on an ad hoc basis with no specific overall programs for site protection currently functioning. But the situation is changing. Reclamation is embarking on a new era in its history, with a change of emphasis in its primary mission. Our cultural resources program is changing as well. I would like to briefly describe what is happening and, based on my agency's experience, suggest that overall management concerns are a basic element in any program. Good management practice can be a potent tool for those of us who are engaged in the protection and preservation of prehistoric and historic resources.

What Reclamation Did/What It Will Do

The US Reclamation Service was established in 1902 to "reclaim the arid lands west of the 100th meridian."* In the philosophy of J. W. Powell, Teddy Roosevelt, and other turn-of-the-century conservationists, "conservation" meant the wise use of natural resources, particularly renewable resources such as water and timber. Powell and others realized that water was the key to settling and development of the Western United States. They envisioned an agrarian West with individual families irrigating small farms with water supplied by dams, canals, and ditches planned, designed, and constructed by Federal engineers. This was the mission of the newly created Reclamation Service. The system worked. Within the first few years, dozens of river systems were tapped, and productive agricultural areas emerged. The availability of abundant and cheap water, hydro-generated electricity from

* Robinson, Michael C. 1979. Water for the West, the Bureau of Reclamation 1902-1977, Public Works Historical Society, Chicago, IL.

Reclamation dams, and land that could be patented through the Homestead, Desert Entry, and related land acts, opened many areas of the West to permanent settlement. In time, as projects became larger and more complex, larger populations were supportable and--for better or worse--Reclamation water and power became key elements in the growth of many Western metropolitan areas, such as Los Angeles, Phoenix, and Las Vegas. The monumental construction of the 1930's, with structures such as Grand Coulee and Hoover Dams, epitomized Reclamation projects of the New Deal Era. Major construction continued through the 1970's. Only a few major Reclamation projects remain unfinished today. By the mid-1980's, it became apparent to Reclamation managers that its 1902 charge of "reclaiming the arid West" was largely achieved. An assessment team of top managers evaluated the status of the Reclamation accomplishments. They also produced a strategy document, "Assessment '87," outlining "new directions" for Reclamation's mission.* With "Assessment '87," the emphasis of Reclamation's mission has consciously shifted from construction to improving efficiency of existing projects, environmental enhancement, developing wetlands, improving water quality, improving electrical power generation, and many related activities.

The "New Directions" for Reclamation provided an opportunity to assess Reclamation's cultural resources efforts. From the perspective of some 20 years after the passage of the National Historic Preservation Act, Reclamation's program could be characterized as being compliance-oriented and largely construction-driven. The programs of each Reclamation region (currently five) were responsive and effective, but for the most part reactive. This is not to say that such a system has not produced important contributions to American archeology. For example, the Dolores Project and Central Arizona Project have produced and continue to produce important archeology. Typically, however, under the construction/compliance-driven system, archeological properties were located in areas scheduled to be affected by construction activities as part of the compliance process, and when appropriate, the mitigation of adverse effects by some form of data recovery completed the "management" process. Compliance with legislative mandates was met. Indeed, in some instances, management truly went beyond just digging; but there was no overall agency

* US Government Bureau of Reclamation. 1987. "Assessment '87: A New Direction for the Bureau of Reclamation," US Department of the Interior, Washington, DC.

program or policy for long-term management of archeological or historical resources.

Reclamation's Program Mission Statement for Cultural Resources

The extensive internal reorganization generated by "Assessment '87" resulted in a shift of functions between offices, etc., and provided the opportunity to develop a program mission statement for Cultural Resources. The mission statement* defined several broad cultural resources management goals that integrated mandated historic preservation responsibilities with Reclamation's "new mission" directions. Approved by the Commissioner of Reclamation in July 1988, the mission statement outlines five major goals. Also, it requires that each reclamation region develop specific programs tailored to meet regional needs that also address the program mission statement goals. Each region has produced a preliminary program during the current Federal fiscal year that identifies needs for the coming 5 years. These programs will be updated each year to include the coming 5-year period.

Program Mission Statement Goals

The program mission statement goals are:

- a. Inventory of agency lands to locate and evaluate cultural resources. As of 1988, about 11 percent of Reclamation's lands had intensive on-the-ground (Class III) surveys. The agency goal is to complete surveys on 25 percent of these lands by 1994.
- b. Inventory and assessment of Reclamation's historical technological heritage. This will focus on the agency's historic properties and documents. Many of Reclamation's projects are becoming eligible for inclusion on the National Register of Historic Places. Construction camps, staging areas, and other construction-related features from the earlier projects are being recognized as significant historical archeological resources.
- c. Management of the above resources. This goal requires the individual regions to develop and implement their individual regional cultural resources program statements, including specific funding, staffing needs, and time schedules.

* US Government Bureau of Reclamation. 1988. "Program Mission Statement for Cultural Resources Management," US Department of the Interior, Washington, DC.

- d. Develop a public education information program concerning cultural resources responsibilities and accomplishments. This goal requires implementing both internal within-agency programs and programs for the broader public. It is as important that fellow employees and managers be informed as well as the general public. It is interesting to note that the recent amendments to the Archeological Resources Protection Act recognized the need for Federal agencies to expand their public education efforts toward archeological resources.
- e. Develop an overall agency policy and strategy for meeting curation responsibilities. This is particularly important in light of the new Federal agency curation standards that have or will be shortly promulgated as 36 CFR Part 79. In addition, Native American concerns toward the disposition of human remains and grave goods in archeological collections make it imperative that materials be uniformly curated to accepted standards.

The Regional Cultural Resources Program Statement will address these goals as they relate to regional construction, operation and maintenance, planning, resource management, and other activities. The program statements are detailed planning and program documents that identify specific activities such as surveys of specific parcels of land. These activities are coordinated with planners, engineers, program officers, and others to ensure that schedules are compatible, funding sources are identified, and so on. In addition, the regional program statements will contain cultural resources management plans. These will be the long-range management plans for specific archeological and historical properties. This is the level on which the technologies of site preservation will be identified and implemented.

With their detailed programs, the regional cultural resources program statements are accomplishing two objectives:

First, they are giving our cultural resources professionals the opportunity to formulate long-range programs for genuine management of archeological and historical properties--whether it be excavation, avoidance, or application of some of the techniques that are being presented in this symposium.

Second, the plans are detailed and hopefully persuasive documents, presented to our managers with sufficient detail and justification to ensure that cultural resources management activities are funded and integrated into the agency's mission.

It is gratifying that as the regional programs are prepared, reviewed, and approved by the regional directors, the cultural resources activities are being integrated into the overall programming and funding. Reclamation's

cultural resources program has been adequate; now it will be more effective as thoughtful planning is combined with more consistent funding and staffing.

Conclusions

In the best of all worlds, it would seem that a variety of historic preservation laws, at both Federal and local levels, would be sufficient so that governmental agencies would adequately protect the resources. In the real world, this ideal is not always achieved. For most agencies, historic preservation is probably one of many competing mandates, none of which may seem totally compatible with the agency's primary mission. I suspect that the agencies that have the most effective historic preservation programs (including elements such as we are concerned with today) are those in which the cultural resources professionals have been able to formulate and then sell their programs to their managers.

The key then would seem to be putting together programs that are thoughtful and well presented. That is, they should:

- a. Be based on applicable legislation, regulation, guidelines, etc., i.e., the manager needs to be assured that what is proposed is "legal." That is, the activities are either required by legislation or regulation, or are allowed within the parameters of the applicable legislation and regulations.
- b. Have attainable goals and milestones for accomplishment. The proposed activities are within the capability of the organization in terms of available or obtainable funding, and they are achievable within the projected time scheduling, staffing, etc.
- c. Have realistic and supportable estimates for funding and staffing. The time, staffing, and funding estimates are based on accepted professional standards for their accomplishment.
- d. Show how the program will integrate into and benefit the overall mission of the agency. It is imperative that the cultural resources manager demonstrate that the proposed activities not only are either required or allowable, but will not disrupt or conflict with the agency mission. This requirement may require some creativity on the part of the cultural resources manager. At a minimum, this requires that the cultural resources manager have a thorough understanding of the agency's activities, procedures, policies, and overall mission.
- e. Be presented in a format that is compatible with the agency's procedures. Again, the cultural resources manager must have a thorough understanding of the agencies' mission, activities,

specifics of applicable projects, and the internal planning and programming procedures.

There is nothing magical or innovative about these ideas. They are simply good basic management principles. Nevertheless, in our enthusiasm and rush to take care of the resources, these simple concepts are sometimes overlooked--and we may come up short.

Archeological site protection and preservation, as we are learning today, is based on professional dedication, insight, and application of a vast array of technology. And, as I have suggested, preservation requires the application of simple and sound management practices on the part of each of us who is charged with preservation of these precious resources.

Alpha to Omega:
Past, Present, and Future Directions for Site Protection
and Preservation in the US Forest Service

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Introduction

The US Forest Service (USFS) is one of the nation's major land-managing agencies. Divided into eight regions and 156 National Forests and Grasslands, the Forest Service is responsible for 191 million acres in 47 states and the Commonwealth of Puerto Rico.

Created in 1891 to protect the watershed as well as the timber resources of the country, its responsibilities have grown over the years to include social and cultural values as well as natural values.

History

The year 1990 marks the 20th Anniversary of the USFS archeology program. Primarily in response to the environmental and historic preservation legislation passed by Congress in the late 1960's, the US Forest Service began to hire archeologists so that legal requirements for site identification, evaluation, and protection could be met. In 1970, three Regional archeologists were hired at a total budget cost of \$50,000. Now, as we celebrate the 20th anniversary of the Forest Service archeology program, we have grown to 229 professionals with a budget of \$15 million. During this period of time, the Forest Service cultural resource program has made remarkable progress in the management of cultural resources.

Prior to 1970, the Forest Service was not noted for its sensitivity to prehistoric and historic sites. For example, it had long been Forest Service policy to burn down old cabins, particularly those in wilderness areas, as safety hazards or "non-conforming structures" that impinged upon wilderness values.

In the early 1970's, as more Forests began to hire Forest archeologists, attitudes among Forest personnel towards this new requirement in their programs ranged from curious, suspicious, to downright hostile. Archeology was seen as yet another red tape, paperwork hoop that stood in the way of their

getting the job done. Many felt that archeology was not a proper function for the Forest Service. The archeology program existed solely to support "real" Forest programs such as timber, range, and engineering. It certainly was not a resource to be managed in its own right. The costs for this new function were seen as being taken away from limited budget funds that should more properly be used for accomplishing required projects.

The Forest Service is a very conservative organization. Its people are traditionally from rural areas, with traditional, rural values. They are tight-knit and view themselves as the "Forest family" that takes care of its own. Fiercely loyal to the organization, they are product-oriented and have a "can-do" attitude to get the job done. Between the various functions, ranger districts, Forests, and Regions, there is always fighting for dollars to get the projects done and to support each unit's personnel.

Archeologists in 1970 were primarily oriented towards an urban, liberal, academic or institutional job situation and, when they suddenly found themselves an unwanted stepchild of the Forest family, experienced a severe dose of culture shock. But over the past 20 years, they have used their skills at dealing with alien cultures so that with the passage of time, cultural resource management is now a well-entrenched, almost universally accepted function in the US Forest Service.

The program has expanded considerably from its initial compliance function to now include six major areas: Compliance, Evaluation, Law Enforcement, Stabilization, Interpretation, and Research. I would now like to review the activities that constitute these major program areas.

Compliance

Compliance activities to provide cultural resources clearance for projects still comprise the major part of the program. Over the years, however, they have ceased occupying a major part of our worrying and wondering how to do it. It is now a rather rote, routine process.

The amount of work varies considerably from forest to forest and is particularly heavy for those regions and forests with the most timber. I would estimate that, on an annual basis, nationwide, each forest averages about 100 projects, intensively surveys about 15 square miles, and records 150 sites.

The amount of land surveyed for each project varies, depending upon site density and the nature of impacts caused by projects.

Survey intensities are determined in consultation with State Historic Preservation Officers (SHPO's). Most forests do their work in-house, but there is an increasing tendency to contract, especially in recent years. Many forests have a para-archeology program, where people go through a training program consisting of classroom and field work under the supervision of forest archeologists. Upon completing this training, and usually a field examination, they are allowed to perform limited surveys. Paras are used differently among Forests, but most tend to do small projects and provide immediate expertise for those Districts that do not have a professional archeologist.

It is Forest Service policy to protect all sites. Unlike many other Federal agencies, it is possible for the Forest Service to modify most of its activities so that sites are avoided. This has led to a lack of emphasis in evaluating sites and nominating them to the National Register of Historic Places. In general, evaluations were seldom done unless a site was going to be impacted by a project. This has led many SHPO's, the Advisory Council on Historic Preservation, and Department of the Interior agencies to believe that the Forest Service was sloppy and really didn't care about cultural resources under its jurisdictions. However, with a policy to protect all sites, evaluation and nomination simply weren't necessary to ensure site protection. In addition, no funds were provided for such work until 1986. Today, however, in the Southwestern Region funds are provided for such work and Forests now produce at least one National Register District or Thematic nomination each year.

Law Enforcement

Archeological law enforcement has been a major focus of the Forest Service. The USFS was instrumental in the drafting of the Archaeological Resources Protection Act and seeing it through Congress. The Forest Service played a major role in the development of the Federal Law Enforcement Training Center's Archaeological Resources Protection Act training course and routinely assists other Federal and State agencies as well as tribal governments in archeological law enforcement issues.

The Forest Service was also responsible for an undercover operation, STOP, in 1982. This resulted in the conviction of 12 individuals and the recovery of \$44,500 worth of artifacts. This undercover work continued with

Operation STAR, to focus on the trafficking of antiquities. Several felony prosecutions have already been made and others are currently under litigation. Most recently, the Forest Service is cooperating with the Bureau of Land Management (BLM) and other law enforcement agencies on another law enforcement initiative to target dealers and middlemen in the pothunting market.

In Arizona, the Forest Service was instrumental in the creation of the Site Stewards Program and is an active participant in its activities. The Site Stewards concept is a program in which volunteers receive training and are then assigned individual sites or areas on public lands to patrol. They assess the condition of sites, watch for evidence of recent vandalism, and report pothunters and vandals should they encounter them during their patrols. This has been a very successful program for enlisting the aid of the public in site protection.

All Forest Service people receive law enforcement training, and in most Forests, archeological site protection is one element of this training program. Although Ranger Districts do some site patrols, little funding is available for this and most patrol as such is accomplished as an incidental activity by District personnel engaged in other project work.

Stabilization

Ruins and historic structure stabilization is fairly new to most Forests. Two buildings have been restored on the Prescott National Forest since 1980, but historic structure restoration has been particularly active in the Northern Region for many years, principally through the efforts of Joe Gallagher and Harrison Goodall. They conduct several training sessions in log cabin restoration each year, resulting in the repair of numerous structures throughout the Western United States. In the last 3 years, several such training programs have been held for the Southwest Region and have resulted in structures being repaired on the Carson, Kaibab, Tonto, and Coconino National Forests. Others are currently scheduled for repairs in future years. In the Southwest, prehistoric ruin stabilization has been conducted on a modest basis since 1980. Stabilization plans have been prepared on most forests and funds for ruins repair have been available on a regular basis for the last several years. A cooperative stabilization plan between Wupatki National Monument and the Coconino National Forest is presently being developed.

Interpretation

It is in the area of archeological site interpretation that the Forest Service has made tremendous gains. While tours of sites and lectures at campgrounds and other places have long been done, a new era in Forest Service interpretation is now happening. A new emphasis has been placed by the Forest Service on recreation and a National Recreation Initiative has been developed, funded by timber sale revenues, to provide new recreational opportunities throughout the country.

Cultural resources play an important role in this new recreation emphasis and a "Windows on the Past" program has been developed to coordinate and highlight cultural resource recreational projects.

In addition to completely funding these projects from Forest Service budgets, a special funding opportunity, Cost Share Challenge Grants, has been created to encourage recreational developments. Under this concept, Forests locate "partners" outside the Forest Service who are willing to participate and contribute to a project. Simple proposals are prepared describing the project and what is being contributed by the Forest Service and the partners. These are then submitted to the Washington Office and also the Regional Office for approval. Approximately 150 projects have already been completed and this year, over 40 projects have been funded in the Southwest Region, 16 in the Southeast, 30 in the Pacific Northwest Region, and more in other parts of the country.

This is a particularly exciting area the Forest Service is moving into. In developing archeological sites for the public, we do not intend to duplicate National Park Service kind of developments. Rather, in most of our interpretive work, we are catering to a different clientele, one that prefers to visit sites in a natural, non-developed setting, or who wants to participate in archeological or cabin restoration work. We will strive to do low-key development so visitors will be able to have a sense of "discovery" when they visit Forest Service sites. By stressing visitor participation and actively reaching out to bring the public to interpreted sites we will have better opportunities to communicate a message for site protection and preservation. Through development, we can also fulfill our obligation as a public agency as well as archeologists--to serve the public.

The kinds of projects completed and planned are quite varied. They include public archeology projects, such as Elden Pueblo in Arizona and the

Passport in Time program in the Eastern Region; automobile self-guided tours to large pueblo ruins, historic logging railroads, Civil War battlefields; participation in statewide archeological events such as Arizona and Utah Archeology Week, Utah's Year of the Ice Age, Colorado's Make Friends with the Past, Oregon's Cultural Resource Celebration, and others in the Southeast; restoration and signing of historic cabins across the country, often done in consort with local groups; hiking trails to rock art sites; mountain bike and equestrian trails along historic roads and railroad beds; production of videotapes on local history, rock art, and public archeology opportunities; construction of "Gateway" visitor centers, publications, and interactive computer video programs to inform the public of developed cultural sites and other recreational opportunities available to them in the region; living history museums and events; oral history interviews; pamphlets, trail guides, and guide books; and a host of other projects are all planned for forests across the country.

Time does not permit a complete listing of all the interpretive projects being planned nationwide, but the following will serve as examples of the variety of recreational opportunities being developed. In the Southwest, hiking trails with interpretive signs and brochures are being developed on five forests, a mountain bike trail on historic Route 66 is underway, and interpretation of many individual sites are planned on all forests. Driving tours to several large pueblo ruins and a historic logging railroad are being developed. A number of visitor centers are scheduled to serve as "gateways" to the various opportunities available to the public. The region's major project is an inter-agency cooperative project with the BLM, State of New Mexico, Army Corps of Engineers, and others to develop a number of sites in the Chama River Valley. Several loop trails will connect these in an integrated interpretive package. A Gateway visitor center for this will be constructed at Ghost Ranch Museum.

In the Intermountain Region, the Huntington Mammoth Project has been important for raising public awareness throughout Utah. It became the focal point for the 1990 "Year of the Ice Age" program. Television programs, scientific conferences, public lectures, exhibits, and other events exposed 550,000 people to information about climatic change, Pleistocene extinctions, and early man.

In the Pacific Northwest Region, a guidebook was prepared showing the public where developed cultural sites could be found. Interpretive signs and

kiosks were installed at several historic sites. A petroglyph was replicated and moved to a campground and visitors were instructed in how to make rubbings of it.

In the Southeastern Region, several historic structures were restored and interpreted in cooperation with local groups. One 1848 mansion is being made into a bed and breakfast lodge with the contribution of \$100,000 cash from interested partners. A living history "Settler's Museum" is being developed adjacent to the Appalachian Trail. And a Civilian Conservation Corps pavilion was restored and converted into a picnic shelter.

In the Eastern Region, the Passport in Time program has been created to allow the public to choose from a number of different activities in which they can participate, from excavation to oral history projects. Last year, 120 people participated in the program and tours were given to 6,000 people. Signs will interpret an Afro-American farmstead and two early mills. The Friends of Round Island Lighthouse was formed as a partnership to restore and maintain this important site, which is seen by over 500,000 people a year. As in several other regions, historic cabins are being restored that the public can rent for vacations. A portion of these rental fees can then be used to provide for the upkeep of the cabins.

In the Pacific Region, a 70-mile-long auto tour will follow the route of an early black mountain man. Another tour, the "Way of the Maidu," will interpret points of mythological importance and describe traditional land and plant uses; another will interpret the industrial development of the early 1900's; a number of early day mansions along Lake Tahoe are being restored as living history museums, as sites for art and cultural events, and one as a visitor center, as part of the Tallac Historic Estates project; and the Gattlin House project on the Lassen National Forest, where handicapped, severely ill, and disadvantaged children are brought together in a summer camp to learn to work together and appreciate the problems of others.

Research

Archeologists in the Forest Service were amazed when they were told they could not do research, and other terms had to be used to "cover" their research such as "assessments, management studies, evaluations," etc. In the Forest Service, there are two major divisions, the "real" Forest Service and

the Research Branch, and research, as traditionally defined by the Forest Service, can only be done by the Research Branch.

This narrow-minded interpretation has changed over the past few years so it is no longer the dirty word it has been in the past. Research is now being done for a variety of purposes and Forest Service archeologists are encouraged to participate in professional activities, as evidenced by the level of Forest Service involvement in recent Society for American Archaeology meetings. Some research is directly related to the new Recreation Initiative, for sites cannot be properly interpreted without doing research first. Some is being done directly by Forest Service archeologists, some is being done by contract to universities and museums, and some is being done by helping to support field schools through the cost share/challenge grant program. Some examples of these are with the University of Missouri on the Mark Twain National Forest in Missouri, the University of Pittsburg on the Oconee National Forest in Georgia, and the Museum of Northern Arizona/Northern Arizona University/Oberlin College on the Kaibab National Forest in Arizona.

Further research has been done using existing Forest site inventory files for Forest Land Management Plans. As part of the Forest Planning Process, Forests are required to prepare overviews and to divide the Forest into study units that will be a framework for assessing and evaluating the cultural resources of the Forest. Data gaps and research needs for these units are to be identified and plans made in the Forest budgets to accomplish additional survey and other work needed for the study units. This will provide for long-term research opportunities not only for Forest archeologists, but for partners in universities and museums as well.

Surveys have been conducted in the Southwestern forests for the past 4 years in these data gap areas. These are areas that, in the past, would not normally be surveyed as they were located in areas in which forest projects were unlikely to take place, such as wilderness areas, for example. But now, under the authority of the Forest Plans and cultural resources overviews, such areas are being surveyed. The surveys are often done in conjunction with para-archeology update training and are often in areas being considered for nomination to the National Register of Historic Places. Consequently, the non-project surveys serve several purposes.

There have also been efforts to create an archeology section within the Forest Service Research Branch. To demonstrate the need for such a section, in 1988 the Southwestern Region sponsored a week-long workshop involving

Forest Service archeologists, academic archeologists, Native Americans, and others to identify research needs in the Forest Service. This resulted in a publication, with papers addressing the research needs that could be addressed should such a section be created.

Several forests are also undertaking oral history projects to collect this information before the many people who have knowledge of the early days pass away. These focus on local history, events, the Depression era, Basque aspen art, and Forest Service history as well. These projects have already provided invaluable information on many areas of local history and, in at least one case, have revealed information that was lost to history. On the San Juan National Forest, interviews with local people revealed information about the Ku Klux Klan in southwestern Colorado between 1810-1930 that had not previously been documented.

Why Has the Forest Service Changed?

As the preceding examples have shown, the Forest Service's cultural resources program of 1990 is a far cry from what it was in 1970. How has this happened?

Many events and factors have occurred over the past 20 years that have allowed these changes to happen. At one level, after approximately 15 years of survey work on the forests, considerable survey work had been accomplished that allowed project clearances to be written with less field work than had been needed in the past. This provided some extra time in which new directions, something other than compliance activities, could be proposed and tried.

On another level, the Southwest Region was sued for poor cultural resource management practices. To avoid taking the case to court, the Forest Service agreed to a settlement that greatly advanced positive cultural resource management and the new directions that we now see. It allowed for the increased funding and professional archeologists needed to do the improved level of work. However, it is important to point out that many of the changes resulting from the lawsuit settlement were already being developed as part of the Land Management Planning Process. The real effect of the settlement was simply making those changes occur faster than they normally would have.

Also, the organization structure of the Forest Service is conducive to such changes. Unlike most governmental agencies, the Forest Service has

historically allowed considerable authority and autonomy at the field level. Consequently, the local level can effect change more quickly and easily than agencies whose authorities come from higher levels. Plus, the Forest Management organization is identical at all levels, from the Washington Office to the Ranger District. This allows a relatively smooth and direct flow of information and ideas from one level to the next, without getting sidetracked by parallel or overlapping administrative levels.

Forest archeologists, with their anthropological training, were able to adjust and be accepted by the alien culture they had suddenly joined. Plus, certain elements of the Forest Service Culture helped this integration. For example, creation of District archeologists in some forests put the archeologist where traditional forest personnel believed such a position should be - at the field level. This helped solidify the District's sense of group identity, and made it distinct from that of the Supervisor's Office where the forest archeologist lived.

In a similar vein, it could happen because it was forest archeologists, working within the Forest Service and talking to their forest colleagues, that allowed forest personnel to see the positive benefits of site preservation and interpretation. It would not have happened had archeologists not been within the Forest Service structure, and at all administrative levels. Current legislative proposals in Washington to combine all Federal archeological programs into a single super agency would, in my opinion, not be as effective and conducive to instituting change of the sort we are now seeing in the Forest Service.

Also, although many Forest Service personnel did not understand or care about prehistoric sites, many had a keen interest in history, and particularly in Forest Service history. In addition, others, such as range conservationists, were interested in past climate and vegetation changes. These interests were shared by the archeologists and provided a bridge that eventually brought a clearer understanding to Forest Service personnel about "holistic cultural resource management."

There was also an educational process on the part of the forest archeologists. Their academic training did not prepare them for dealing with people other than other academics. It took some time for archeologists to "come down to earth" and to accept the "serve-the-public" orientation of the Forest Service. An example of this is the change from hiding the location of sites from the public to the new move of encouraging the public to come visit

sites. Our initial reaction was to protect sites by keeping locations secret. After several years, it was obvious that people who were damaging sites already knew where they were - they didn't need to see our records. And, from working with the public, we realized that most people didn't want to damage a site and were also concerned about site destruction. We have since learned that one way to protect a site is to attract people to it. Their presence keeps serious vandals away.

Much of the reason is due to efforts on the part of Forest Service archeologists to show they did represent a resource that was valuable to the Forest Service and one that the public was interested in. With the lack of budgeted funds, many forests turned to volunteers and amateur archeologists to accomplish archeology-related projects. This showed management that there was considerable public interest, and also helped build a constituency to support the development of archeological programs in the Forest Service.

In the process, archeologists began providing recreational opportunities for the interested public years before the National Recreation Initiative came into being. When it did, archeologists were already prepared to take advantage of its opportunities.

But most importantly, there has been an overall change in American society that has directed the change. This was made manifest during the public involvement process associated with the Land Management Planning process. The public made it abundantly clear, across the nation, that they were not happy with the timber and fire emphasis that had characterized the last 20 years of forest activities. They wanted more recreation, wildlife, and "amenity" values and were politically astute enough to get that message across to their Congressmen.

As a result, the National Forest Service recreation budget has increased \$100 million over the past 5 years (the level we were at in 1980 before Reagan budget cuts) and the Office of Management and Budget is recommending higher amounts for various recreation functions than the Forest Service originally requested.

This same societal change was also reflected in the Forestry profession itself and in the new generation of foresters. As the old guard "timber beasts" who dominated the Forest Service of the 1970's retired, they were replaced by younger people, many of whom had been trained with a more multi-resource orientation than characterized the past generation.

New attitudes are also being shown by Regional Foresters and Forest Supervisors that express the new public attitudes. At a recent conference at Sunbird, ID, the Regional Foresters of the West prepared a position paper for the Chief of the Forest Service in which they also call for a change from past practices.

This message was heeded by the Chief, and the Administration as well. Word is now coming out of our Washington Office that the time has come for the Forest Service to reaffirm the conservation, wise use management philosophy under which we were formed 100 years ago. It is the Chief's desire for the Service to reassume the environmental conservation leadership role it once held. Cultural resource management (CRM) can do much to help effect such a change.

A changing attitude within the archeological profession has also helped the change. In the 1970's the debate on "real" archeology versus CRM was in full swing. There was an attitude that only third-rate archeologists would join "the Feds." The American Society for Conservation Archeology was founded during this time because those in CRM could not get the ear of the profession, specifically the Society for American Archaeology (SAA). Over the years, this attitude, too, has changed, as witness the number of CRM-related symposia that have been accepted to the SAA and the historic Save the Past for the Future initiative the Society has recently embarked upon. Receiving the credibility of the profession has made it easier to convince Forest Service management that these new changes were needed and worthwhile.

What Does the Future Hold?

If the unusual swing of the pendulum in Federal finances is any indication, these new directions for cultural resource management are likely to continue for 15 to 20 more years. Thus, I think we have great things to look forward to.

In addition, all predictions about recreation in the future also suggest the interpretive push of the present is here to stay. It is predicted that tourism will be the No. 1 industry in the world by the year 2000. In 1980, visitation to historic and cultural parks and monuments was 46 percent higher than that at natural parks. It is predicted that the demand for prehistoric and historic sites for visitation will increase beyond our abilities to provide them. This is also reinforced by the latest profile of American

tourists. These studies indicate that American tourists have less time for recreation, and thus tend to go to a single destination, rather than tour around for a period of time. When they get to that special place, they want an intense, high quality interpretation, since they are better educated than before. So it would seem recreational development of archeological sites is the way of the future.

Because these same demands will occur at sites on other public lands, it is also likely that there will be more inter-agency development of archeological sites and coordinated, high quality interpretation. This process has already started between the Forest Service and the BLM in Arizona and New Mexico, and there are ongoing projects such as the Roosevelt Lake Project on the Tonto National Forest and the Chama River Valley Gateway on the Santa Fe National Forest that presently involve other Federal and State agencies. With the increasing economic value of tourism, we can also expect partnership projects to occur with the private sector. This is also happening at the present time on the Coconino and Prescott National Forests, where commercial tour operators are helping to fund and develop several sites for commercial interpretation.

There is a serious information need that we must have in order to properly develop sites for interpretation. Little information exists on visitor behavior and control in outback locations. Most visitor information in this country comes from National Park Service facilities, which is a different segment of the population than presently visits outback sites and is different from the predicted tourist of the future. A few studies have been done in Australia of tourist behavior in unregulated settings, and these provide some good initial information. But other studies are needed if we are to develop sites and still protect their important qualities.

We have an immediate problem, however, in that change is happening faster than we can accommodate it. It is impossible to change the compliance orientation the Forest Service has had for the past 20 years and turn it around overnight into the multifaceted program we are starting to see. We are now receiving funds to do projects, but have not had the time or opportunity to prepare the plans to do the projects. It will likely take us several years to catch up before the planning and implementation scheduling is on track.

As these new directions develop and new opportunities occur, forest archeologists will find themselves more and more desk bound, preparing budgets and proposals, and new job opportunities will become available for

archeologists who want to branch into the recreation field in addition to archeology. I would thereby predict that within a few years there will again be a number of Federal archeology jobs available, such as there were in the late 1970's.

It is an exciting time to be an archeologist in the Forest Service. Positive changes are occurring to the program faster than we can keep up with them, yet we have a fantastic opportunity to learn more about the archeological resource and to provide new educational and recreational opportunities for the public, whom we ultimately serve. As Evan DeBloois, our Washington archeologist, the first archeologist hired by the Forest Service, recently said - "This is where I wanted to be 20 years ago!"

The Status of Archeological Site Preservation
in the National Park Service

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Introduction

Since it was founded in 1916, the primary mission of the National Park Service (NPS) has been to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (Public Law 235, 64th Congress). With increased visitation, and development of areas surrounding the parks, the achievement of this mission has become increasingly difficult.

Although many people equate the National Park System with wildlife preserves or wilderness, there is now a growing recognition that the parks also represent archeological preserves. Management decisions are placing increasingly greater emphasis on the preservation of cultural resources, including archeological sites. In years past, the NPS has attempted to preserve archeological sites through a policy of benign neglect. It was felt that sites which were left undisturbed in a "natural setting" were being preserved for the benefit of future generations.

Unfortunately, this hands-off policy of archeological site management is not always successful. Sites located in many NPS areas are threatened by wind erosion, wave action, stream channel migration, and other natural processes. When a significant site is threatened by erosion, NPS is obligated to consider preservation alternatives in the treatment of that site(s).

The preservation of archeological sites in the National Park Service has a relatively long history, unfortunately it is almost totally the story of ruins stabilization in the Southwest (Richert and Vivian 1974). Eroding archeological deposits without standing walls were most often preserved through data recovery, known largely as "salvage archeology." The NPS became involved in salvage archeology through a long relationship with the River Basin Surveys. This relationship developed an attitude that excavation of threatened sites was the preferred alternative.

More recently, the NPS has developed a growing interest in finding ways to preserve sites in primary context. This has been encouraged, in part, by the recognition that in-place preservation will permit future generations of archeologists to extract more information from sites than is possible today. However, the growing accumulation of archeological collections has also contributed to this preservation philosophy. Management is becoming increasingly aware of the scope of the archeological collections under their stewardship, and the attendant cost of properly curating those objects forever. Consequently, proposals for preserving sites in situ are being received with increasing interest.

This paper is an attempt to describe the range of NPS responses to situations where archeological sites are threatened by visitor use, park operations, or natural erosion. The paper does not address standing structures or ruins. It must also be made clear that while I have attempted to incorporate data and opinions obtained from colleagues throughout the NPS, the opinions presented here are largely a product of my own experiences.

Conflicts with Visitor Use and Visitor Use Facilities

One of the biggest problems in managing archeological resources within the NPS is the need to provide suitable visitor use facilities. When people come to visit the National Parks, they expect to find campgrounds and trails that will permit them to experience scenic beauty. In many areas, the same factors which make a particular location suitable for a modern campground, made that location suitable for habitation by past visitors as well. Consequently, there is pressure from campground planners to build on landforms with archeological sites. In many of the newer parks, the NPS has inherited campgrounds or other facilities from state or local parks. In some of these cases, facilities have already been built on, or next to, significant archeological resources.

In cases where planned facilities would adversely affect archeological resources, the NPS has been willing to look at alternative locations. However, it is our experience that the planners who drive the decision-making process on these issues are not well sensitized to the value of archeological resources. Other values, such as scenery, visitor convenience, etc., are often given higher priorities in the initial planning stages. We have found that if advocates for the archeological resources are sufficiently determined,

it is possible to convince higher level management to consider locations which will have less adverse impact on archeological resources.

In cases where facilities are already present, and archeological resources are being adversely affected by use of the facility, responses vary greatly from park to park. At the Gooseneck site in Ozark National Scenic Riverways (Lynott 1989a), a significant prehistoric site deposit was being damaged by vehicular traffic within a designated campground (Figure 1). NPS designers used archeological recommendations to upgrade the facility and protect the archeological site. The design changes in the campground included moving the road off the archeological deposit, covering the archeological deposit with soil, and installing barrier posts around the site deposit to inhibit off-road vehicular impacts (Figure 2).

Comparable situations occur at many parks, where campgrounds were already established when the presence of archeological resources was identified. However, due to the fragile nature of the natural resources, and the expense of constructing new camping facilities, there is often considerable reticence to moving existing facilities. While management is willing to consider the value of archeological resources, funding concerns, natural resource values, visitor convenience, and other values may take precedence.

Pedestrian traffic is damaging archeological sites in many parks. This is a particularly difficult problem in parks where there is a high density of archeological sites in areas which are also the focus of visitor use activities (e.g. lakeshores, riverbanks). In most cases, archeologists working with park managers have been able to reroute formal trails to avoid continued impact. In other areas where impact from foot traffic is not associated with formal trails, stabilization is more difficult.

At Golden Gate National Recreation Area in California, a historic midden was being adversely affected by off-trail pedestrian traffic and illegal camping. The park removed some vegetation which made the site more visible for law enforcement patrols, and less desirable for illegal camping activities. The installation of a turf stabilization matting has permitted vegetation to become better established on the sloping sides of the midden, and appears to be resolving the problem with erosion from pedestrian traffic (Figure 3).

At Grand Canyon National Park, several sites have been damaged by informal pedestrian foot trails. Maintenance crews have worked to formalize trails in these areas and reroute pedestrian traffic away from the sensitive archeological remains (Figure 4). The use of carefully placed, thorny desert



Figure 1. Archeological excavation of features underlying the campground road at the Gooseneck site, 23CT54, prior to moving the road, Ozark National Scenic Riverways



Figure 2. The campground road at the Gooseneck site, 23CT54 has been moved and sediment is being added to old roadbed to protect the underlying site deposit, Ozark National Scenic Riverways



Figure 3. Turf stabilization matting was installed on a historic midden to reduce erosion from pedestrian traffic, Golden Gate National Recreation Area

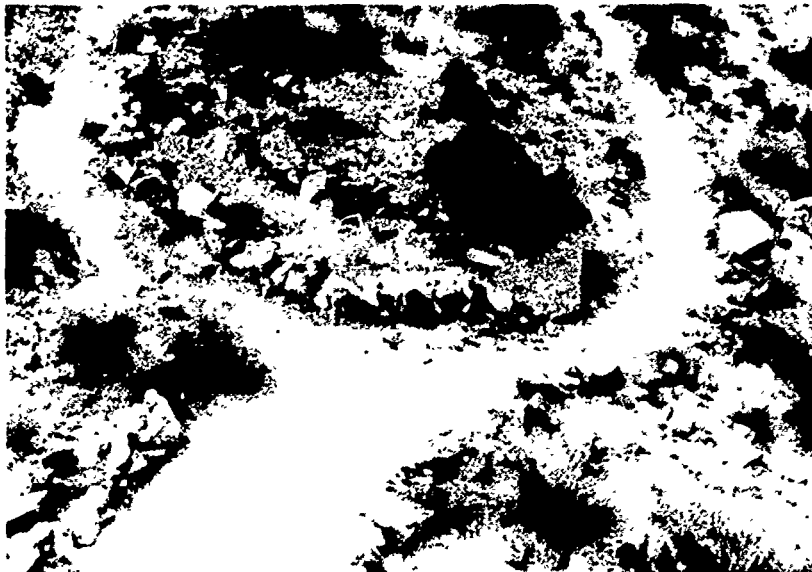


Figure 4. Trails are formalized in the area of archeological sites to reduce impacts from pedestrian traffic, Grand Canyon National Park

vegetation has also helped to discourage informal pedestrian traffic and reduce erosional impacts (Figure 5). In one instance where a prehistoric midden was being heavily eroded, a dry-laid sandstone retaining wall was constructed to preserve the site deposit (Figure 6). Since much of the impact to archeological sites in the inner canyon occurs from visitors on rafting trips,



Figure 5. Cactus and other thorny vegetation are used to close informal trails and protect archeological sites, Grand Canyon National Park



Figure 6. A dry-laid sandstone wall was constructed to protect a prehistoric midden from erosion resulting from pedestrian traffic, Grand Canyon National Park

NPS personnel have also counseled with the professional rafting community to advise them of proper etiquette regarding archeological sites (Balsom 1990).

Impacts From Natural Erosion

Recent publicity has made it clear that many units of the National Park System are being affected by factors which originate beyond their boundaries. Voyageurs National Park has inherited a lacustrine system that was enlarged by dam construction in the early 20th century to provide hydroelectric power for the lumber industry. Many lakeshore archeological sites which predate 1915 are located in the enlargement zone and are subject to seasonal inundation and mechanical erosion from wave action. Archeological survey has identified 328 sites, of which 74 percent are being directly impacted by shoreline erosion and/or inundation.

Testing has indicated that many of these sites still have intact archeological deposits of varying size, including some with preserved organic food remains. Since these sites represent the only record of prehistoric aboriginal occupation of the area, and one of the best records of historic aboriginal occupation, the National Park Service has taken steps to preserve the sites with the most research potential.

The approach which has been used at Voyageurs National Park consists of recontouring eroding banks by adding comparable matrix quarried from another location. Since very little of the park is accessible by terrestrial vehicle, the most economical and practical way to accomplish the work is by building ice roads in winter. During normal winter conditions, temperatures in northern Minnesota are sufficiently cold to build adequate ice to transport trucks and heavy equipment (Figure 7). These are then used to move sediments to the eroding bank, and recontour it to a 1:1 or more moderate slope.

After the bank slope has been recontoured, a trench is cut at the base and the top of the slope. Filter fabric is then installed on the slope and anchored in the trenches at the head and toe of the slope (Figure 8). Filter fabric that conformed to US Army Corps of Engineers guidelines was selected (Keown and Dardeau 1980). This insures that groundwater may pass through the filter fabric, but most of the sediments are held in place. The side seams of the filter fabric were overlapped and anchored to the ground with 40-cm- (16-in.-) long steel pins. Installation of pins was occasionally complicated by ground frost.



Figure 7. Winter season ice roads represent the best way to move large quantities of soil matrix to stabilize shoreline sites at Voyageurs National Park



Figure 8. After fill was added to the eroding bank, a layer of filter fabric was installed. A minimum of 6 in. of soil was added to cover the filter fabric, Voyageurs National Park

When the filter fabric was installed, another layer of sediment was added to cover the filter fabric to a minimum depth of 15 cm (6 in.). This soil was pushed onto the bank with either a backhoe or front-end loader. Hand labor was used to smooth and contour the final slope. Grass seed was then raked into the soil and the slope was covered with a turf stabilization mat. The mats were pinned in place using the same steel pins used to anchor the filter fabric. The final step in the stabilization process involved the application of riprap along the water level. Riprap, consisting of locally procured and natural-looking rock, was laid to cover the slope to 60 cm above and 30 cm below the average summer high water level (Figure 9).

Thus far, stabilization efforts of this type have been used at three sites at Voyageurs National Park (Lynott 1984, 1988, 1989b). All have been successful. However, we had problems at the Sweetnose Island site, where warm weather forced termination of the project before the intended quantity of riprap was installed. Repairs to the stabilization work and the installation of additional riprap were accomplished by barge the next summer (Figure 10).

At Golden Gate National Recreation Area in California, one of the few remaining prehistoric sites in San Francisco County was treated with sandbags, jute netting, and plantings in an attempt to stabilize erosion at the site (Mayer and Kelly 1980). The site is a midden on a west-facing slope that was impacted by early 20th century construction, and is now being eroded by heavy pedestrian traffic and wind action. The initial stabilization effort at this site consisted of the construction of sandbag retaining walls along vertical cuts in the site deposit. The eroding areas were then covered with jute netting, and seeded with drought-resistant grasses. Ice plant was transplanted throughout the area as well. Within about 4 years, the sandbags had deteriorated from the combined forces of pedestrian traffic and marine weather (Figure 11). In some areas, the ice plant which was planted in the jute netting has become established and is effectively protecting parts of the site.*

In another area of Golden Gate National Recreation Area, a historic midden has been successfully stabilized through the application of a turf stabilization mat. In this instance, the turf mat was laid across an area of thin vegetation and exposed soil. The turf mat seems to have given native vegetation sufficient protection from runoff to permit it to become

* Personal Communication, 17 October 1989, Roger E. Kelly, Regional Archeologist, National Park Service Western Regional Office, San Francisco, CA.



Figure 9. Local rock was used to riprap the edge of the waterline at stabilized sites, Voyageurs National Park



Figure 10. An early spring thaw forced postponement of stabilization work at the Sweetnose Island site, 21SL141. Work was completed by barge during the summer months, Voyageurs National Park



Figure 11. Stabilization efforts using ice plant and sandbags on a west-facing prehistoric midden at Golden Gate National Recreation Area have been only partly successful. Within 4 years, the sandbags had deteriorated, but the ice plant is holding parts of the site in place

established. The established vegetation now acts as a protective covering for the site.

At Point Reyes National Seashore, several midden sites on west- and southwest-facing bluffs are being eroded. The NPS attempted to arrest erosion on one of these sites by constructing a wooden bulkwark on the bluff edge (Figure 12). This has successfully permitted vegetation to become established along the bluff edges, and has greatly reduced erosion of the site.*

On San Miguel Island in Channel Islands National Park, midden sites are being severely impacted by marine weather. Logistics are difficult, and stabilization material can only be transported by aircraft. Experimental efforts using stabilization cloth, biodegradable netting, and sandbags were attempted at four sites. A detailed system for monitoring erosion at these locations was developed by the University of California, Santa Barbara (Walker and Snethcamp 1983; Snethcamp 1984). After 5 years, it was discovered that the sandbags actually accelerated windblown undercutting of vertical faces, and they have been removed. However, installation of the stabilization fabrics

* Personal Communication, 17 October 1989, Roger E. Kelly, Regional Archeologist, National Park Service Western Regional Office, San Francisco, CA.



Figure 12. Installation of wooden bulkwark was used to reduce erosion and permit vegetation to become established at Point Reyes National Seashore

has resulted in increased colonization of grasses and ice plant, and a subsequent decline in the rate of deflation in those areas.

On the Southeast coast, at Cumberland Island National Seashore, erosion resulting from wind, waves, and daily tidal fluctuation has severely deteriorated the Brickhill Bluff site (Ehrenhard 1989). An experimental attempt to mitigate this problem through stabilization was planned for 1989. Unfortunately, the project has been delayed by hurricane Hugo, and will be conducted in 1990. Brush and fallen trees from the shoreline will be reoriented to form a breakwater in the area exposed at low tide. A shell dike, designed to imitate natural shell rakes, will be built immediately behind the breakwater. The shell dike will be constructed of burlap bags filled with hand-collected shells. A layer of "geo-web" will be pinned to the surface behind the shell dike and the eroding bank. Marsh grasses will be planted in the geo-web between the shell dike and the eroding site bank. This approach is designed to reduce the erosion at the site, and retain an essentially natural-looking shoreline.

Not all of the NPS site stabilization efforts have occurred in lacustrine or marine areas. At Hubbell Trading Post National Historic Site in Arizona, a prehistoric Basket Maker site was being eroded by wind and water from a tributary arroyo of Pueblo Colorado Wash. Stabilization of the eroding bank was accomplished by filling the eroded area with soil and covering the newly contoured bank with filter fabric along the base of the slope and a turf stabilization mat along the top of the bank.* The latter was intended to encourage vegetation growth on the upper portions of the stabilized site bank. Overall, the project has been successful, but vegetation growth on the new bank has been deterred by domestic sheep grazing.

Conclusions

Stabilization of archeological sites that do not have standing ruins is a relatively recent development in the NPS. For years, sites which were threatened by erosion were routinely "salvaged." Recent technical developments in the types of stabilization materials available, coupled with the growing crisis over the volume of archeological collections which must be curated, have served to encourage alternatives to the traditional approach of data recovery, or salvage. While there is growing support for methods which preserve archeological deposits in situ, many factors combine to slow the application of these methods.

One of the principal deterrents to the widespread use of site stabilization techniques in the NPS is directly related to the lack of expertise in this field among archeologists and cultural resource managers. While the synthetic fabrics that are often used in these projects have widespread engineering applications, they are relatively new to cultural resource managers.

As reports of successful efforts at site stabilization become better known, more cultural resource managers will consider using these approaches. The publication of source materials, such as "The Archaeological Site Protection and Preservation Notebook" (US Army Corps of Engineers 1989), will make results of site stabilization efforts known to a wider audience.

Site stabilization within the National Park System is also inhibited by logistic considerations. Many of the sites which are candidates for

* Personal Communication, 1989, Ronald J. Ice, Director, National Park Service Southwest Cultural Resource Center, Sante Fe, NM.

stabilization are located in back country settings, where it is very difficult to transport the necessary materials. While the logistic difficulties may not be insurmountable, they do increase the costs of these projects. Since site preservation programs are in a fledgling state throughout the NPS, high costs resulting from logistic problems make it difficult to promote these projects.

Finally, there are some "philosophical" problems that inhibit more widespread adoption of site stabilization efforts. Most NPS managers have been trained extensively in the appreciation of natural resources, but have received considerably less training about cultural resources. Consequently, when site preservation projects are in conflict with directives affecting natural resources (e.g., wetlands management), natural resource management considerations are often given priority. Less controversial conflicts have arisen from the desire to establish vegetation on a newly stabilized bank, and the need to insure that only native plants are used. While it is desirable to use native seeds and planting for these projects, it is difficult to find proper materials since appropriate native plants and seeds are not widely distributed through commercial markets. These obstacles to site preservation efforts do not prohibit these projects in the NPS, but they do require that all parties associated with the project be thoroughly committed to the preservation objective.

During the last 10 years, responses to plans for site stabilization in the National Park Service have changed. Initially, projects like the ones we have described were viewed as interesting preservation anecdotes. More and more, they are being viewed as preferred alternatives. During the next decade, it is likely that site stabilization and preservation will become standard procedure. When that happens, the NPS will have moved one step closer to performing the role for which it was established.

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Geographic Information Systems: A Tool for Protecting
and Evaluating Archeological Sites

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Introduction

Over the past 12 years, an inventory of archeological resources on the Fort Hood Army Installation in Central Texas has been virtually completed. To date, over 95 percent, or approximately 300 square miles of the undeveloped portion of the Installation, has been intensively surveyed as part of a gradual step-by-step effort. This multiphased program, conducted through a series of surveys and other archeological research projects, has resulted in comprehensive documentation of over 2,300 archeological sites. Each project was authorized and programmed as an overt management attempt to comply with legal requirements to prevent unnecessary impacts associated with a large number and wide variety of potentially destructive Army actions. In straightforward terms, the funding mechanism was simply the recognition of archeological survey responsibilities under section 106 of the National Historic Preservation Act. The long-term result of this management strategy has also meant significant progress in complying with all legal requirements, including Executive Order 11593 as well as sections 106 and 110 of the National Historic Preservation Act.

From the inception of the Fort Hood Program in 1977, a decision was made to embark upon a long-range survey where an archeological inventory could be created one bite at a time. It was also decided to postpone significance evaluations of archeological sites until evaluations could be accomplished in the more holistic context of a regional database. In other words all sites were considered significant until proven otherwise. The concept of forgoing site by site significance evaluations until sites could be formally analyzed in a broader context has had two necessary corollaries: (a) site-by-site evaluations associated with piecemeal surveys were regarded as preliminary, pending possible revision once more comprehensive information was considered, and (b) in those cases where a particular property was planned to be categorically subjected to catastrophic and irrevocable impact, conventional site evaluations were accelerated on the basis of existing information available at that time. In this way the process inherent in section 106 of the

National Historic Preservation Act could still proceed with appropriate mitigation measures if necessary.

Put another way, the goal of the Fort Hood Archaeological Resource Management Program has been to resourcefully use selective information about all sites to objectively evaluate the entire inventory. The objective of focusing on the protection of a fewer number of high priority sites should not be construed as an end to the management process but simply an important milestone or tool for more efficiently meeting long-term management commitments and establishing further protection and mitigation priorities.

The development of a comprehensive database and the use of geographic information systems for analyzing archeological variability was a joint effort involving the Fort Hood archeological staff, the Arkansas Archeological Survey, and the U.S. Army Corps of Engineers at both the Construction Engineering Research Laboratory and the Waterways Experiment Station. Our objective was to develop explicit procedures to derive a grouping of all sites into three management categories: (a) those sites recommended for long-term protection and preservation, (b) those sites not recommended for preservation and protection, and (c) those sites recommended for further investigation before grouping into one of the two above groups. The goal of this research, put succinctly, was to select a priority sample of the most significant archeological sites at Fort Hood and reduce the management burden of continuing to try to protect all sites in the face of potentially massive impacts.

Primary data for the Fort Hood inventory consist of an estimated 16,000 or more pages of site records. It is estimated that the field work alone for producing these records amounted to over 60,000 hours of effort. Approximately 3,000 site records were reviewed in our analysis. Many of these records represent multiple recordings from site monitoring projects. Over 27 percent of the sites in the inventory have been recorded more than once, some as many as five times.

Because the evolution of the primary database occurred over a period of some 12 years and involved a large number of participants, concerted efforts were required to orchestrate its step-by-step development. Under the typical conditions of changing contractors in cultural resource management, it becomes imperative that someone accept the primary responsibility for formulating and implementing long-range database management goals, including establishing a formal set of detailed information acquisition procedures and acceptance of

the responsibility for the quality of the overall database as the sum, if not more than the sum, of all its various contractor-contributed parts.

Site Protection

This investment in information is also routinely paying some handsome dividends by offering low-cost impact avoidance and site protection opportunities. For about 8 years now, the data have been routinely used to formally plan and coordinate literally thousands of potentially destructive military and civilian actions. These activities include construction and other excavations involving heavy equipment for engineer training or ground-disturbing installation maintenance actions such as construction of roads, trails, and firebreaks. Other actions such as recreation activities involving off-road vehicles and motorcycle courses and a myriad of military training activities with high archeological impact potential are accomplished by avoiding archeological sites.

A primary method for coordinating so many potentially destructive actions has been installation regulation requiring formal written concurrence from the archeological staff of the Directorate of Engineering and Housing on all proposed earth modifications using heavy equipment. Proponents of such actions are required to submit in advance a standard form describing the planned action including preferred locations for their requirement. This Fort Hood Form 1077 becomes the basis for negotiating an avoidance strategy for conducting these actions in areas with no known archeological resources. Being able to immediately access the automated Geographic Resources Analysis Support System (GRASS) database and window in on a proposed area means that the 1077 negotiation can be expeditiously handled. In all but a few cases the proponents are allowed to complete their mission by simply complying with some designated location restrictions. The avoidance plan is drawn up on a 1-in. to 400-ft scale map. Although several thousand such actions have been successfully coordinated in this fashion over the years, the process is not without flaws, particularly if avoidance plans are not adequately monitored.

Other examples of site protection options made possible by using the Fort Hood automated geographic information system (GIS) database include planned construction projects such as multimillion-dollar training ranges and range facilities located purposely to maximize archeological site avoidance. The construction of a road and bridge system as well as other installation

facilities turned out to be actually less expensive than an original plan that would have impacted several archeological sites. After using the detailed site location information based on a complete archeological survey of the affected area to redesign the road construction, it was found that the new route actually involved less cut and fill than the original route that would have necessitated expensive data recovery mitigation and time-consuming construction schedule delays.

Vegetation clearance using bulldozers was successfully planned and executed using GRASS and the archeological site location information. Several thousand acres were required to be cleared in order to improve training capability by increasing line of sight and providing more realistic armored training. GRASS was used to design and locate the vegetation clearance project. A composite map was made by overlaying slope and vegetation layers in the Fort Hood GRASS database. The vegetation information was based on an unsupervised classification of Landsat imagery. Density of vegetation and steepness of slope were easily determined from the composite overlays. Since there was no need to eliminate vegetation on steep slopes, the clearance plan adopted limited the heavy equipment activity to flat areas with heavy vegetation. All archeological sites in these areas were marked with colored survey tape. Project personnel, including all heavy equipment operators, were briefed on the site avoidance plan and shown on the ground the sites to be avoided. Thus the vegetation clearance was accomplished by avoiding all archeological sites.

In another case a particular area previously little used for armored training was opened to increased maneuver training. Archeological sites in this particular area were therefore subjected to increased potential maneuver damage. A program of site protection for some 77 prehistoric and historic sites was initiated with the concurrence of the Texas State Historic Preservation Officer. Site protection measures were designed on a case-by-case basis. A suite of some 14 different protection scenarios was employed. These techniques included barriers and obstacles, such as triple strand concertina wire, simulated mine fields, and chemical, biological, or radiological contamination areas. Some sites were protected with dirt work engineering projects to reroute maneuver traffic or block roads and trails giving access to sites. Other engineering efforts included dirt, rock, and cut brush obstacles. Selected site burial under 18 in. of exotic off-site fill was undertaken at four sites.

After 18 months and some 1,000 potentially damaging maneuver training events, the 77 sites were revisited to formally gather data on the effectiveness of the protective measures. In general, the statistical analysis of the before and after condition data indicated that the site protection efforts were successful in reducing adverse impacts associated with increased maneuver training. Despite some methodological problems, such as reliability of methods for detecting change and scales for measuring changed condition of sites, the research results were very encouraging. A cost comparison showed that site survey, protection, and monitoring were significantly less expensive than costs expected for conventional data recovery to clear the area. The cost comparison was based on expected costs for data recovery that were typically being paid to our contractor at that time. Details of the methods and techniques employed in this study, as well as the statistical analysis and follow-up monitoring to evaluate the effectiveness of the protection measures employed, can be found in Carlson and Briuer (1986).

The use of a comprehensive automated cultural resource management database to successfully avoid specific impact events in a cost-effective manner has been shown to be a practical management alternative to conventional data recovery mitigation. This approach is a possible management strategy, not a panacea. The protection of sites and avoidance of impact events driven by section 106 of the National Historic Preservation Act must not be confused with the long-term stewardship requirements of section 110 of the same public law. The avoidance of a particular threat to a site can still lead to the ultimate destruction of the site by subsequent, even unrelated, actions despite the best of intentions of everyone involved. Along with the option to protect and avoid impact goes the responsibility to monitor and evaluate through time whether or not the protect-and-avoid option is or is not really working. Otherwise, the protect-and-avoid option has the danger of being nothing more than a cheap, quick fix, where the only thing really being avoided is long-term management responsibility. Management, like stewardship, is a process, not an administrative event. A comprehensive, automated cultural resource management database is an excellent tool for meeting the difficult challenge of managing resources as an ongoing process.

Site Evaluation

The above discussion on the use of the Fort Hood automated database for protecting archeological sites has heavily relied on little more than locational information. Yet the database in question actually encompasses a vast number of attributes about cultural, environmental, and management-oriented information for each of some 2,300 archeological sites, as well as extensive information on the geographic region itself. Relational database files were first created in DBASE III after reviewing some 3,000 site records. These data include field and laboratory observations such as chronological indications on both historic and prehistoric sites based on thousands of artifacts observed, collected, analyzed, and classified.

Other observations on site characteristics include data on site type such as: open air, rock shelter, lithic scatter, midden, domestic site, and special-purpose historic site. Information on site size, artifact density, artifact sample size, etc. are other examples of cultural information incorporated in the research. Management data, such as information on the physical condition of sites and data on the frequency and intensity of training and other military land usage, were also a part of the database. Environmental information from a great variety of map or remote-sensed sources was incorporated in the GRASS database. Examples of environmental data include soils, vegetation, hydrology, slope, elevation, and much more.

All site attribute data were eventually transferred to INFORMIX files, where GRASS analyses supported by the S statistical software package could be more efficiently accomplished. For a complete description of the research to select a representative sample of the Fort Hood inventory see Williams, Briuer, and Limp (1989); Limp, Williams, and Briuer (1990); and Briuer, Williams, and Limp (1990). A phase of exploratory data analysis was initiated (Hartwig and Dearing 1979; Hoaglin, Mosteller, and Tukey 1983; and Tukey 1977) where merged data from all of the above kinds of sources were systematically examined. The scope of this analysis involved some 72 variables from historic sites and about 150 variables from prehistoric sites. Univariate, bivariate, and multivariate analyses were run taking advantage of the powerful S statistical options. Statistical (S) methods used included, but were not limited to, histograms, scatterplots, box plots, principal component analysis, and cluster analysis.

The attempt to demonstrate patterning using the above procedures resulted in isolating seven dimensions of variability: (a) completeness and integrity of data, (b) the age and cultural affiliation of sites, (c) artifact composition and density of material on sites, (d) morphological attributes of sites, such as the presence of middens or mounds on prehistoric sites, and chimneys, cellars, or rubble, etc. on historic sites, (e) topographical aspects of the land, (f) quality of the land or potential of the land around each site, and (g) the preservation potential of sites based on potential impacts or threats from military training.

Cluster analysis considering all seven data dimensions resulted in isolating about 200 clusters of sites. From these clusters of sites about 700 representative sites least threatened from military impacts were recommended for long-term preservation. About an equal number of sites were recommended for further study because of incomplete or inadequate available information. Approximately one third of the inventory was not recommended for preservation in view of information suggesting its redundancy in the inventory.

Summary

The methods used to protect and evaluate sites in this paper have exploited the use of readily available automated information technology including: DBASE III, INFORMIX, CAD, and GRASS supported by the S-Statistical package and other automation software. The use of these management tools means that applied research traditionally involving time-consuming, tedious, and cumbersome analyses can be accomplished accurately and rapidly. These management tools are becoming readily available as well as user-friendly. The approach used at Fort Hood, if considered elsewhere, can insure greater flexibility for considering a wider range of cost-effective and highly responsible management options that can be employed through time as advanced cultural resource management databases are developed.

The Fort Hood database, including GRASS/GIS and other automation and statistical tools, is being routinely used to prevent unnecessary archeological damage or destruction from literally thousands of day-to-day installation activities. At the same time, this set of tools provides the informational basis for objectively selecting a representative sample of sites for long-term preservation. The database and site evaluation methods discussed in this

paper have employed exploratory data analysis as well as univariate, bivariate, and multivariate statistical techniques, including cluster analysis to objectively group and classify a large and diverse archeological site assemblage in ways that can be replicated, reiterated, and most importantly, improved upon in the future.

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Site Preservation Strategies at Canyon de Chelly National Monument

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Introduction

Canyon de Chelly National Monument in northeastern Arizona has long been known for its impressive array of prehistoric archeological resources, many of which contain standing architecture, perishable remains, and exceptional examples of rock art. While most of these resources exhibit substantial preservation, a variety of factors adversely affect these resources. Foremost are those problems associated with natural deterioration, a list that includes wind erosion, exfoliation of sandstone surfaces, extreme temperature variability, direct sunlight, rodent and insect damage, slumpage of site surfaces, and a wide range of water-related impacts. Particularly significant in regards to water damage is the documented severity and magnitude of arroyos cutting throughout the drainage system, which has already resulted in catastrophic loss of archeological materials and data. For the purposes of this paper, addressing deterioration from natural sources is termed "preservation."

Equally serious, but considerably more difficult to measure, are a host of impacts deriving from historical and modern human occupation, use, and, in some cases, abuse of Canyon de Chelly. These impacts include the effects of visitation to existing interpretive sites, unauthorized visitation and site entry throughout the monument, reuse of areas containing archeological resources, widespread direct and indirect stock damage, general travel across the canyon bottoms and plateau, intentional vandalism, and pothunting. For the purposes of this paper, those resource management strategies that attempt to mitigate the effects of humanly induced or cultural practices are termed "protection."

In addition, a number of archeological resources have sustained damage stemming from early excavation and/or stabilization practices. This is an unusual composite of natural and cultural degradation.

In short, the archeological resources of Canyon de Chelly are being damaged through numerous, generally gradual factors that cumulatively degrade them or in the long run pose a fundamental threat.

Addressing this problem requires management-oriented data that for various reasons have not been collected on a systematic basis. It also requires enough research-oriented archeological data to make wise decisions. At this point, we simply do not have those data. Numerous archeological investigations have been conducted in Canyon de Chelly. These have generally focused on only a few of the largest sites, such as Earl Morris' quest for Basket Maker features below later Anasazi construction during the 1920's and 1930's (Morris 1925), or Don Morris' excavation of Antelope House in the 1970's (Morris 1986), done as a prelude to stabilization work. A second difficulty is in the development of our discipline and its new standard of practice, which renders data collected by Mindeleff in the 1890's (Mindeleff 1897) or DeHarport in the 1940's obsolete (DeHarport 1959). Even Don Morris' efforts of the 1970's were not geared toward the collection of management-oriented facts on a sustained basis. A major deficit lies in our inability to evaluate site condition or integrity with precision or confidence.

There is also uneven coverage when DeHarport's survey of Canyon de Chelly is compared with the site distribution of the adjacent Canyon del Muerto. The former has sites on terraces, along the floodplain, and near the current watercourse. In del Muerto, the sites are much more distant from the current watercourse, in small rincons, on talus slopes, or in cliffside settings. These distinctions may reflect the greater ability of more youthful or better-equipped del Muerto surveyors to get into ruins of more difficult access, or a difference in settlement strategy that is somehow linked to a narrower canyon bottom or population isolation from the other canyon. Finally, there is no coverage at all either in Monument Canyon, the third major drainage in the system, or in the upper canyons. Nor has much work been done on the rim, where few sites beyond those of current or historical Navajo residents are thought to exist. For these areas, the National Park Service (NPS) is faced with the difficult task of managing fragile yet significant cultural resources within what can only be called an informational vacuum.

The size and physiographic complexity of Canyon de Chelly effectively prohibit an intensive examination of the entire monument, which consists of about 130 square miles of rugged deep canyons or relatively isolated rimland. Even if we consider what DeHarport and Don Morris did as "done," about 100 square miles remain unstudied. Parenthetically, this is an area almost twice the size of Wupatki National Monument, also located in northern Arizona,

with a tenfold increase in logistical difficulties, yet Wupatki took 8 years in the field to inventory.

We anticipate that a partial solution to the foregoing problem will lie in a 3-year project designed to develop an archeological resources protection and preservation plan for Canyon de Chelly National Monument. In general, the project will be concerned with evaluating the present level of site-specific archeological information, enhancing surface documentation where necessary, identifying factors that have a damaging effect upon the resources, and designing appropriate mechanisms or intervention strategies. The result of these efforts will be a preservation and protection plan that evaluates sites or groupings of sites, and attempts to apply a suite of various management strategies to each site or group. It will also assess past preservation activities and provide a series of ancillary archeological studies that contain descriptive and analytical summaries of significant information. The goal here is to first and foremost produce a document of particular utility to NPS managers, and only secondarily to provide scientific discussions. Consequently, this project is not equivalent to either a complete archeological inventory or sampling survey of the Monument.

Project Philosophy: Using Some New Approaches

Not long ago, the NPS would have approached this problem within a fabric modification milieu. That is, we would have taken the available project dollars and attempted to make masonry repairs on as many of the sites at Canyon De Chelly as we could, after prioritizing the sites based on some offhanded process, and these repairs would have continued as long as the money held out. The type of plan we are preparing represents a divergence from the foregoing approach for two reasons. First, it attempts to more carefully look at the nature of the sites before deciding what to do. Secondly, and what I consider to be a major importance, it reflects a much less drastic impact on the resource. Many other strategies besides masonry repair are considered. Examples include fencing, increased patrol presence or interpretive focus, and finally, value preservation through increased documentation. This minimal fabric intervention perspective is important.

I have argued in favor of such an approach for several years because it avoids what I call "ruins stabilization paradox." While involved in ruins stabilization paradox, we become so busy making sure that walls do not fall

down, that we modify many wall attributes or features, sometimes stabilizing them out of existence in the interest of preserving form and outline. The American public is then left with an exhibit lacking either research or heritage value and archeologists are, at best, left with replica sites to study. Traditional stabilization work involving fabric alteration is one strategy, but should be viewed as a last ditch attempt. On the other hand, we may elect to preserve the "values" of original craftsmanship or the behaviors that are reflected in the wall. This emphasis calls for preservation of values, with fabric stabilization merely a fortunate byproduct. Examples of these values include preserving aboriginal craftsmanship, identifying the range of variability of construction behaviors, or idiosyncratic efforts, in what is largely an additive technology that can be studied in the same ways we look at ceramic manufacture. This approach calls for intensive architectural documentation. An increase in architectural documentation level is desirable because it preserves options about resource use for the future, including the data-bearing potential of each wall or other architectural unit.

To digress for a moment regarding the NPS Cultural Resource Management (CRM) Guidelines (National Park Service 1985) that identify and supply standards for various activities and studies, the proscribed litany runs something like this: literature searches, perhaps supplemented by reconnaissance fieldwork, supply an overview or assessment summary of the archeology of a park; as complete a survey as is possible takes place when weighing the available dollars against the viability of sampling; and from this we move into a testing program conducted as a separately funded entity, if none was a component of the inventory/sample survey. Almost all other cultural programs are site specific: historic structures reports, structure preservation guides, etc. These studies are generally called for in a resource management plan that uses available survey data to identify needed studies and implementation strategies for each park. Unfortunately, these guidelines do not call for a preservation or protection plan of the type being developed at Canyon de Chelly. Consequently, despite their potential utility, these plans must compete for scarce Federal dollars while viewed as an "extra," non-essential, or luxury type of program.

The effect of this approach on the NPS CRM Program is a failure to obtain adequate baseline data during surveys. There are two potential resources for solving this problem. One solution is that future baseline survey type programs must acquire management-oriented data because it is the

only opportunity to acquire information on site condition, integrity, accessibility, and visibility and assessment of degrading factors. Work done using traditional research values simply is not adequate because there is often no explicit statement on integrity or the caliber of resource condition. The other solution is to codify preservation and protection plans by adding them to the list of essential or mandated studies in the CRM Guidelines. This is also one way of augmenting surveys conducted prior to the collection of management-oriented data.

Management-Oriented Data and Management Objectives

In order to structure this project, eight management objectives have been defined. Each of the objectives refers to a portion of the overall preservation or protection problem at Canyon de Chelly, at the same time adding considerable information to the existing archeological database. Table 1 summarizes the focus of each objective by detailing the specific problem, ancillary tasks or background studies, level of investigation and field methods, what will be needed in the field, and expected results and/or products. To collect the data necessary to address these objectives we anticipate using three levels of documentation, ranging from a less-intensive, more generic package, to a very comprehensive and intensive package. The most intensive approach is termed Level I, the least is termed Level III. Because of their importance to the overall research program, the various levels of documentation and data collection procedures are discussed in more detail later in the paper.

Objective 1: Evaluation and enhancement of archeological database

As noted above, the reliability of the archeological database is questionable. Therefore, the first objective of this project is to complete a review of all published and unpublished materials related to the archeology of Canyon de Chelly and then evaluate this information in relation to existing field evidence. Since we lack the funding for a total comprehensive evaluation, a general evaluation of the existing database will be carried out for reconnaissance level areas, while an in-depth examination of available site-specific information will be accomplished in the areas receiving intensive investigation. Any enhancement of the archeological database (including site condition statements related to resource management) will be based upon the

Table 1

Description of Project Objectives, Requirements, and Expected Results

| Objective | Levels of | | | Expected Results/Products |
|-----------|---|---|---|--|
| | Preparatory Studies | Investigation/Documentation | Required Resources | |
| 1 | Research and compile all existing site-specific information and develop techniques to evaluate the available data in terms of site characteristics and conditions. Develop specific survey strategy for those areas being intensively investigated. | <p>i. Reconnaissance level general examination of archeological database with emphasis on the relocation of existing cultural resources.</p> <p>ii. Intensive level detailed examination of archeological database in specified areas. Enhancement of database where possible. Level III documentation.</p> | Reconnaissance team (2 crew members), survey team (5 crew members), no equipment beyond basic survey gear. | <ul style="list-style-type: none"> • Reconnaissance Study on Prehistoric Cultural Landscapes. • Enhanced documentation packages on all site classes. • History of archeological research within monument. • Archeological base map modified. • Partial inventory of human skeletal remains. • Thematic resource preservation guides. • Technical studies as applicable. • Components - final report. |
| 2 | Research and compile all existing information concerning the location, characteristics, and condition of LCS sites. Explore the technical possibilities of doing axonometric or oblique angle projections as part of documentation approach. | <p>Level II documentation standards will be used for most LCS sites. However, documentation at Level II standards will only be accomplished for those sites requiring enhanced recordation.</p> | Reconnaissance team (2 crew members) LCS documentation team (3 crew members), additional photographic and survey equipment required (e.g., video camera and plane table/alidade). | <ul style="list-style-type: none"> • Enhanced documentation packages for most LCS sites. • LCS inventory and base map. • LCS database upgraded. • Ruins preservation guides, by site. • Technical studies, as applicable. • Components - final report. |

(Continued)

(Sheet 1 of 4)

Table 1 (Continued)

| Objective | Levels of | | | Expected Results/Products |
|-----------|---|--|--|--|
| | Preparatory Studies | Investigation/Documentation | Required Resources | |
| 3 | Research and compile all information related to scientific investigations and stabilization histories of Mummy Cave. | Combination of Level I and II documentation standards. | Mummy Cave Documentation Team (3 crew members). Additional photographic and survey equipment. | <ul style="list-style-type: none"> Enhanced documentation package. Ruins preservation guide. History of stabilization. |
| 4 | Research and compile all existing information concerning the distribution, characteristics, and condition of rock art sites. Conduct comparative studies concerning the interpretation, analysis, and preservation of rock art. | i. Reconnaissance level general inventory of rock art sites through canyon system. ii. Intensive level detailed study of rock art sites in two portions of canyon system. Modified Level III documentation standards. | Rock art documentation team (3 crew members). | <ul style="list-style-type: none"> Partial inventory and base map of rock art sites. Enhanced documentation packages for rock art sites. Rock art preservation guide and proposal for expanded study. Technical studies as applicable. Components - final report. |

(Continued)

(Sheet 2 of 4)

Table 1 (Continued)

| Objective | Preparatory Studies | Levels of | | Expected Results/Products |
|-----------|---|--|--|--|
| | | Investigation/Documentation | Required Resources | |
| 5 | General background research cover-Navajo settlement and land-use patterns and any information related to Navajo reuse of prehistoric Anasazi sites and/or facilities. Specific background research concerning the Navajo inhabitants presently living in Canyon de Chelly, NM. Investigate the potential of using aerial photography and mapping to accomplish objective. | i. Reconnaissance level general overview type examination of the canyon system with emphasis placed on mapping the extent and basic characteristics of Navajo settlement. | Reconnaissance team (2 crew members), survey team (5 crew members). | <ul style="list-style-type: none"> • Reconnaissance study - Navajo. • Map of Navajo settlement and land use at various levels of resolution. • Enhanced documentation packages for some Navajo sites. • Identification of articulation between Navajo and prehistoric sites. • Resource Preservation Guide - selected sites. • Components - final report |
| | | ii. Intensive level detailed study of Navajo settlement forms with particular emphasis on identifying the extent and character of articulation between Navajo and prehistoric cultural landscapes. | | |
| 6 | Background research concerning the dynamics of arroyo cutting throughout the Southwest with particular emphasis on the effects this factor has upon archeological resources. Examination of techniques concerned with the stabilization and/or control of arroyo cutting and erosion in general. | i. Reconnaissance level general overview type examination of the canyon system. Initial mapping, inventory of sites being affected, and prioritization of problems. | Reconnaissance team (2 crew members), survey team (5 crew members), 1 assigned to objective). Aerial photographs essential. | <ul style="list-style-type: none"> • Map of arroyo cutting and impacted cultural resources at various levels of resolution. • Prioritized list of sites being affected by arroyo cutting. • Technical studies, as applicable. • Components - final report. |
| | | ii. Intensive level detailed study of sites being affected by arroyo cutting erosion in two areas of the canyon system. | | |

(Continued)

(Sheet 3 of 4)

Table 1 (Concluded)

| Objective | Levels of | | | |
|-----------|--|--|-------------------------------------|---|
| | Preparatory Studies | Investigation/Documentation | Required Resources | Expected Results/Products |
| 7 | Background research examining the comparative aspects of environmental and human factors that adversely affect archeological resources. | Thematic synthesis of previous objectives. | Principal Investigator responsible. | <ul style="list-style-type: none"> • Technical studies, as applicable. • Components - final report. |
| 8 | Background research examining the preservation and resource management practices at Canyon de Chelly, NM. Comparative study of intervention strategies that have been used throughout the world to protect and preserve archeological resources and monuments of cultural significance. | Thematic synthesis of previous objectives. | Principal Investigator responsible. | <ul style="list-style-type: none"> • Technical studies, as applicable. • Components - final report. |

level of investigation, site type, and an assessment of immediate threats to resource integrity or value. This equation essentially determines which documentation package will be employed.

Objective 2: Examination of
List of Classified Structures (LCS) sites

The LCS is an inventory of all sites with standing walls (i.e., above grade). At present, the LCS inventory for Canyon de Chelly contains 117 separate highly visible and therefore highly vulnerable Anasazi prehistoric and historic Navajo archeological sites. All of these sites, as well as any additional resources exhibiting substantial standing architecture, will be revisited and documented to the Level I standard. Virtually all of the LCS sites require upgraded documentation and a more detailed evaluation of their present condition. Since these resources represent some of the most visible, and therefore vulnerable, cultural resources in the monument, it is imperative for this field effort to compile sufficient information to augment the LCS database and develop a detailed ruins preservation guide for all classified structures within the monument. Therefore, those sites meeting the criteria for the LCS will be uniformly recorded according to Level II documentation standards. If the frequency of these sites exceeds the capabilities of this project, a distinct possibility considering the unevenness of the archaeological database, a prioritized list will be developed to accomplish this goal in the future.

Objective 3: Research
and documentation of Mummy Cave

Following the guidelines previously noted, a combination of Level I and II documentation standards will be employed to record Mummy Cave. Not only will this documentation considerably enhance our present information, it will also provide the basis for a Ruins Preservation Guide specific to Mummy Cave. In general, this documentation conforms to a thorough, non-destructive level of structural investigation as outlined in NPS-28 (National Park Service 1985). However, since only a few prehistoric ruins have been documented in this fashion (e.g., Sliding Rock (Nordby 1981) and Betatakin and Keet Seel (Dean 1969)), additional efforts will be made to incorporate anthropological concepts concerned with construction behavior, functional identification of architectural units, and site organization. Thus, the documentation and Ruins Preservation Guide for Mummy Cave will contain substantive descriptive detail,

a history of stabilization activities, and analytical statements focused on explaining the interpretive significance of the site.

Although this documentation program represents a substantial investment in time and project resources, both very precious commodities, it has the potential to demonstrate the applicability of Level I and II documentation standards for other large prehistoric sites in Canyon de Chelly.

Objective 4: Examination of rock art sites

Objective 4 is very specific in nature. Although Canyon de Chelly contains a great diversity of well-preserved prehistoric and historic Navajo rock art panels, there is little systematic information concerning the frequency, distribution, overall characteristics, condition, and related preservation problems of these sites. The sheer magnitude of the problem once again prohibits a comprehensive inventory. To address this problem, the rock art examination will follow the documentation packages already outlined. Therefore, the two geographical areas in the canyon receiving intensive investigation will be thoroughly surveyed for rock art sites. Reconnaissance areas will be more selectively examined. What should result is a detailed view of the intensively studied areas coupled with an overall, but less precise, estimate of rock art sites and their condition in the reconnaissance area.

Documentation of rock art sites will be limited to a three-page narrative form, sketch maps, and photographs. This documentation will provide a basic inventory of panel characteristics, describe preservation conditions, and evaluate the level of future documentation required to comprehensively examine the site. Since rock art can occur as either isolated panels or components of larger sites, it is expected that considerable overlap will occur with the other documentation and evaluation objectives outlined.

Objective 5: The Examination of Navajo cultural landscape

An artifact itself, the Navajo cultural landscape, reflects both the organization and use of space. As it has evolved, it has adversely affected the prehistoric cultural resources of Canyon de Chelly. These effects range from the reuse of specific sites for any number of activities to large-scale modification of large areas for settlement and agricultural purposes. At the same time, the Navajo landscape has its own significance as part of the cultural resources of the monument. Therefore, this examination will also collect information on the points of articulation between the prehistoric and Navajo landscapes. Given the complexity of this issue, however, our project

will only provide a broad overview, rather than a comprehensive study of the Navajo landscape.

Objective 6: Measuring the effect
of arroyo cutting upon cultural resources

As mentioned above, active arroyo cutting presents an extremely serious and increasingly severe threat to the preservation and informational integrity of archeological materials. This threat must be measured in such a manner that we can effectively predict the rate and severity of deterioration upon the complete range of cultural resources. Examining this problem will depend upon acquisition of past aerial photography and comparisons in the field using geomorphologists, especially in the areas of most active cutting.

This study will basically survey, map, and describe the extent and characteristics of arroyo cutting throughout the canyon system. From this effort we should be able to identify present and impending effects (e.g., documenting sites presently being impacted versus those that might be affected in 5, 10, or 20 years), prioritize and recommend intervention strategies (ranging from simple documentation to a full-scale data recovery program), and develop estimates of the overall magnitude of the problem.

Objective 7: Assessing human and
environmental factors of deterioration

The central task of this objective is to synthesize information from the preceding six objectives in order to (a) identify all relevant factors, whether human or environmental, that are having an adverse effect upon cultural resources, (b) develop scalar techniques so that the effects of these factors can be comparatively measured, and (c) create a model that recognizes the complex interrelationship between human and environmental factors in the deterioration of cultural resources. Although aspects of this objective may seem rather abstract, efforts of this sort actually go to the heart of the matter with regard as to how we perceive the preservation of both tangible historic fabric and abstract informational value. Therefore, instead of trying to arrive at standard statements concerning resource preservation, this objective seeks to explain the mechanisms underlying why one resource survives in good shape, while another simply vanishes.

Objective 8: Evaluation
of previous preservation efforts

Ever since Canyon de Chelly was incorporated as a unit of the NPS there have been efforts to preserve the architectural character and interpretive content of the cultural resource. These efforts have included everything from

archeological investigations designed to collect data, limited access throughout the canyon, public education, law enforcement and resource monitoring, fencing programs, and stabilization. At this point in time the relative success or failure of these techniques needs to be evaluated in a dispassionate and analytical fashion. This is not an effort to identify mistaken policies or practices, but rather an attempt to isolate what has worked and how we might improve upon it. Clearly, many of these programs have accomplished their original goal, as exhibited by the abundance of extant cultural resources in Canyon de Chelly, but time, increasing visitation, general use of the canyons, and the prevalent threat of intentional vandalism suggest the time has come for a more integrated approach.

Products

This information will all be integrated into a comprehensive preservation and protection plan that weighs recommendations covering both research and heritage values. Unfortunately, there are few previous documents like this within the framework of either the NPS or preservation literature in general. We hope that this project, and the products that accrue from it, will break some new ground in terms of programatically and somewhat objectively ranking sites and identifying value-retaining strategies with a minimum of fabric alteration.

Field Approaches

As indicated previously, we have designed a project that articulates two kinds of information: a reconnaissance level and an intensive level. Each is designed to collect comparable data, but at different scales. The documentation packages and field methods for each level reflect both project objectives and the logistical realities encountered while working in the canyons. Both levels collect data that address the same resource management objectives.

Reconnaissance Level Investigation

Using information garnered from available literature and short forays into portions of the canyon, the reconnaissance level investigation will pertain to the entire canyon system, but will be based on field studies in only a

specified number of areas. Although most of the resource management objectives will be addressed during the reconnaissance, this effort will be concerned less with archeological detail and more with broad statements regarding the patterning of cultural resources, their present condition, and predominant resource management problems. Basically, the reconnaissance will relocate any sites previously identified but with inadequate or suspect data. Of particular interest are sites on the LCS, which were added because they had walls standing above grade, the primary criterion for inclusion. Once at these sites, field crews will collect low-level archeological and site condition data, and produce a cursory evaluation of degrading factors at each site. Ultimately, this approach will lead to an assessment of adverse natural and human impacts across the entire spectrum of cultural resources. At the same time, the reconnaissance will help identify archeological data inadequacies for site classes, based either on site morphology or location within the canyon.

Documentation methods for the reconnaissance will include area notes describing overall characteristics of natural and cultural resources, general and site-specific photography, location of cultural resources on US Geological Survey topographic maps, and completion of a relatively simple inventory of site features and conditions. In the case of those sites already on the LCS (N = 117), as well as those not presently listed but clearly eligible, a more detailed documentation approach will be utilized (as outlined above in Objective 2). This should produce a complete inventory, but not necessarily documentation, of all LCS sites and substantially improve existing levels of information.

Those areas of the monument selected for reconnaissance level investigation include the upper portion of Canyon del Muerto above Mummy Cave, Black Rock Canyon, from the mouth of the canyon system up to Many Cherry Canyon (Canyon del Muerto) and Spring Canyon (Canyon de Chelly), Bat Canyon, Monument Canyon, and all of Canyon de Chelly above Spider Rock. The rimland or plateau areas of the monument will not be investigated during this 3-year project.

Intensive Level Investigation

In contrast to the reconnaissance, the intensive level investigation will collect detailed information, but is limited to two areas within the canyon system. These are the middle portion of Canyon del Muerto from Many

Cherry Canyon to Mummy Cave, and a similar segment in Canyon de Chelly extending from Spring Canyon to Spider Rock. This investigation will utilize detailed field survey and data enhancement methods to provide a more accurate depiction of site frequencies, characteristics, and preservation conditions. Along similar lines, an intensive examination of adverse natural and human factors will be conducted.

Documentation packages for the intensive investigation are considerably more detailed than those used for the reconnaissance. Following a graduated scale, these methods go from a relatively simple, inventory-like approach that we have termed Level III to an exhaustive compilation we are calling Level I. The latter is very similar to the standards developed for the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation, but entails the wall-by-wall study used by Nordby (1981) while working at Sliding Rock Ruin, in Canyon de Chelly (Figure 1). Custom application of each package to each site comprises one of the major challenges to this approach, and depends upon existing site-specific information and the requirements of the resource management objectives.

Level III Documentation

This level of documentation is designed to achieve baseline information that includes data on site location, environmental context, site description, material culture, and aspects of resource management. Additional documentation will come in the form of a measured plan, at least two photographs, and point location on both US Geological Survey topographic maps and aerial photographs. Finally, those sites containing evidence of historic Navajo materials (Objective 5), rock art (Objective 4), and exposed human skeletal remains will be further documented using supplemental forms. This approach integrates material already available in published/unpublished sources with field observations in order to enhance the database, rank sites in terms of significance, and provide better resource management information. With the exception of those sites eligible for the LCS, any newly discovered archeological sites will be documented in a similar fashion.

One particularly sensitive issue surrounds the identification, documentation, and disposition of human skeletal remains. Over the past number of years the NPS has been called upon by the Navajo canyon residents to remove exposed skeletal remains. We have responded positively to these requests, and

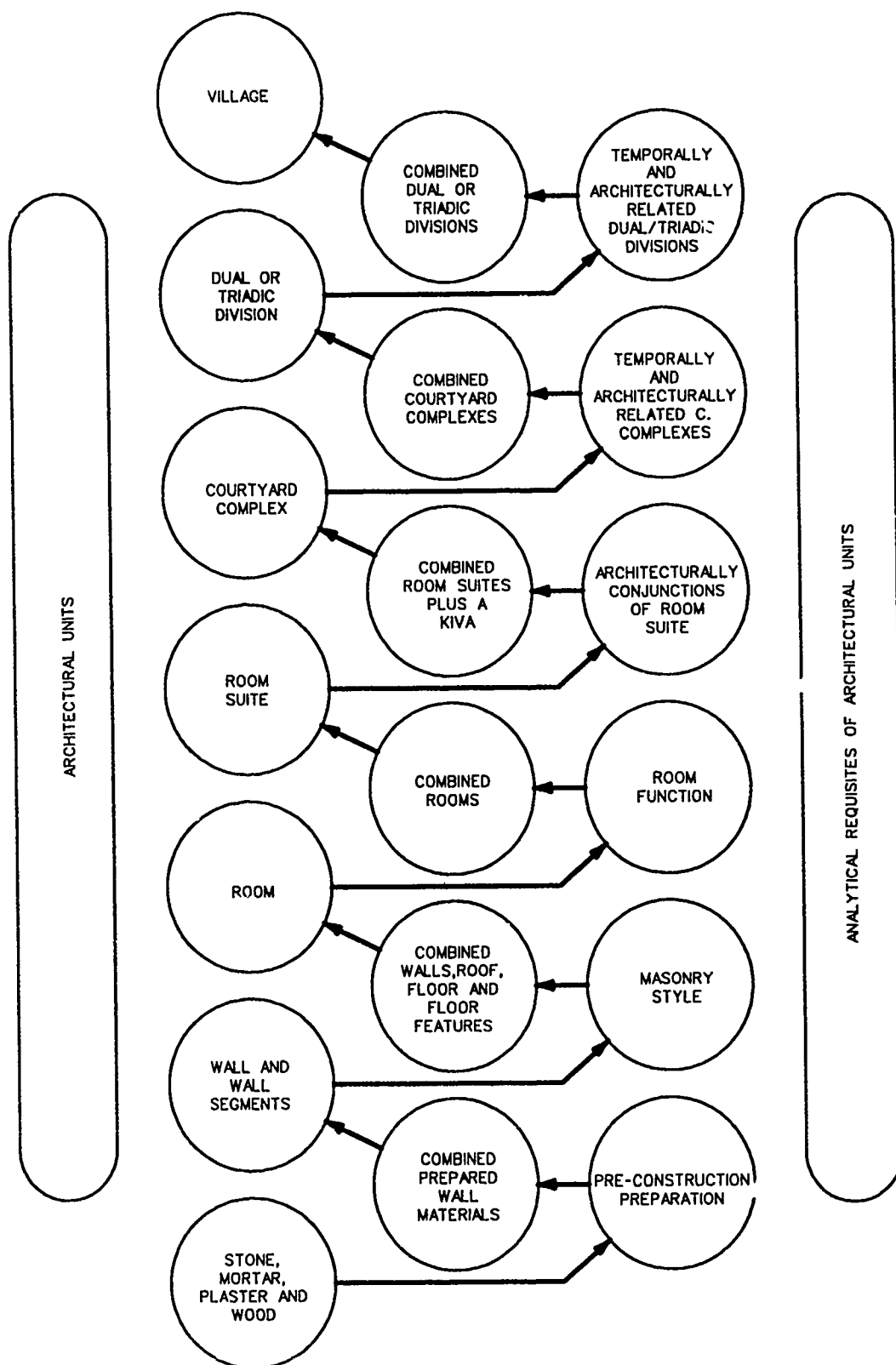


Figure 1. Analytical model for understanding prehistoric technological and social parameters at Sliding Rock River, Canyon De Chelly, Arizona (after Nordby 1981)

these materials were removed using established scientific procedures. The renewed concern on the part of Native Americans elsewhere suggests that the Park Service should develop new standards and guidelines for the sensitive handling of human skeletal remains. In the absence of a finalized Service policy concerning this issue, we plan to pursue a conservative approach that favors in situ documentation, field cataloging, and site stabilization in regards to human remains.

Level II Documentation

Level II documentation provides more detail than Level III by expanding the basic narrative form to include increased data concerning architectural characteristics and condition. Further documentation will be accomplished through measured plans, sections, drawings of architectural details, oblique or axonometric views, and overlapping photographic and video coverage. In keeping with the architectural documentation, a complete stabilization assessment will also be completed. In general, only those sites that are presently listed on or eligible for the LCS previously mentioned will be documented at Level II standards. Exceptions to this rule would include those resources that are threatened by immediate loss.

Level I Documentation

The most complex documentation methods incorporate all of the recordation efforts of Levels II and III, but carry them to the detail of wall-by-wall analyses. Clearly, this produces a very exhaustive depiction of site characteristics and condition that is only amenable to thorough, non-destructive standards of structural investigation (i.e., Historic Structures Reports).

Conclusions

This paper has outlined a multiyear program which is designed to accomplish several objectives. Among these objectives are the evaluation of the quantity and quality of the presently available prehistoric and historic aboriginal site database, adding to that body of information, and better definition of the various natural and cultural agents impacting these resources.

From these data, a comprehensive site preservation and protection plan can be developed, one which addresses future preservation needs and weighs the advantages and disadvantages of different management strategies. As noted, our long-range goals involve careful examination of both the sites and the ongoing impacts and undertaking such an effort with a minimal amount of impact to the resources' features. Utilization of non-impacting documentation and preservation procedures will greatly increase the likelihood that future generations can enjoy these sites in their native condition and not as modified, but stabilized, artifacts of our own making. Additionally, adoption of such a strategy will permit and enhance the future research potential of these important vestiges of past cultures.

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The Kentucky Archeological Registry: Landowner
Participation in Site Preservation

by

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Introduction

Concern for the protection and preservation of archeological sites has been voiced for about as long as their destruction has occurred. The passage of the National Historic Preservation Act of 1966 and subsequent laws and regulations, as well as state antiquities laws and regulations, have made the protection and preservation of archeological sites a matter of public policy. Yet for the most part, these laws only provide for the protection of sites located on Federal, State, county, or municipal property, or those sites threatened by destruction from State or Federally licensed or permitted projects. Generally, archeological sites located on private land have not benefitted from any programmatic site protection policy.

In Kentucky, where over 90 percent of the state is privately owned, a program directed at involving landowners in the protection and preservation of archeological sites has been implemented. The program was developed by the Kentucky Nature Preserves Commission for the Kentucky Heritage Council, and was funded in part by a survey and planning grant from the National Park Service. Called the Kentucky Archeological Registry, this site protection program is modeled on the Nature Preserves Commission's natural areas registry program, which follows the land protection formula of landowner contact/site registration developed and implemented by The Nature Conservancy (TNC), an organization created to find, protect, and maintain the best examples of natural communities, ecosystems, and endangered species (The Nature Conservancy 1988, p 3).

TNC's Land Protection Model

In most situations, the only way to ensure that a property is managed correctly and that its important resources, be they natural or cultural, are preserved and protected, is for the land to be acquired "in fee," that is, all rights to the property are acquired (Ford 1983; Hoose 1981, pp 26-27). While

acquisition may afford the best protection, it is not always the most feasible approach. Acquisition assumes that the current owner is interested in selling the land in the first place. But landowners can possess a great deal of emotional attachment to their land, causing them, oftentimes, to simply not consider selling their land under any circumstances. Other limits to land acquisition, as outlined by Hoose (1981, pp 27-32), include the great expense incurred by land purchase, an increasing opposition to the withdrawal of private land by the public sector from taxation and development, the changing and unpredictable tax laws, and the need to act quickly in some circumstances to protect sites when they are suddenly threatened. Therefore, even though acquisition can provide the strongest protection, realistically, it can be utilized to protect only a few resources and then only with large investments of time and money.

Because of the limitations inherent in acquiring land as a primary method of resource protection and preservation, TNC uses a number of other techniques in its successful efforts to preserve natural diversity. These techniques differ in the speed in which they can be used, their cost, the strength of the protection they offer, the duration of the protection they offer, and the degree to which they restrict a deed (Hoose 1981, p 29). When these techniques are used within the context of a multi-faceted preservation strategy (i.e., a variety of different options or tools that are applied situationally, tailored to each individual opportunity), TNC has been able to accomplish its goals of land protection and preservation without the acquisition of land, and larger areas and more species have been preserved and protected in the process.

Landowner contact/site registration is one of these techniques. In many cases, it is the first step TNC takes towards securing protection of natural diversity. Landowner contact/site registration represents a fairly simple, straightforward approach to land protection. It assumes that the landowner has an interest in the resource and will not purposely destroy it, and it assumes that the landowner will act as the resource's steward by virtue of the commitment made to the Registry Coordinator.

On the face of it, landowner contact/site registration appears to provide virtually no protection for the resource. In actuality, few cases of breach of commitment have occurred in the more established natural areas registries and the species for which the property was registered have remained undisturbed. Many landowners take their registry commitment seriously and

will call the Registry Coordinator with questions regarding activities they wish to carry out at the site that they think might damage or disturb the resource.

TNC's landowner contact/site registration program was first implemented in Indiana in 1980 (Hoose 1984, p 7). Now 26 states have some form of registry program in place. Since site registration efforts first began, over 2,000 owners of property with rare and endangered species have been contacted, providing voluntary land protection for over 135,000 acres of land nationwide (Ohio Chapter, The Nature Conservancy 1987, p 1). Given the track record of the natural areas registries, it can be stated unequivocally that landowner contact/site registration is a successful preservation strategy, which has led to the protection of many species that might otherwise have been destroyed (Carmony 1982, 1987).

Because the goals are identical and the problems are similar, landowner contact/site registration should be an effective way to preserve and protect significant archeological sites. Surprisingly, however, few landowner contact/site registration programs have been incorporated into the archeological community's approach to site preservation. The Archeological Conservancy, modeled after TNC (Ford 1983), does not pursue site protection in this manner. A site protection strategy questionnaire sent to all 56 State Historic Preservation Officers (SHPO) (33 responses were received, a 58.9 percent response rate) revealed that though 15 states had some form of archeological registry program "on the books," none of these registry programs, based on the information provided on the questionnaire, were composed of exactly the same elements as TNC's landowner contact/site registration program model (Henderson 1988, pp 19-21).

The Kentucky Archeological Registry

The Kentucky Archeological Registry was developed to provide an effective way of protecting Kentucky's most significant archeological sites, especially those located on private property, by involving landowners in site preservation. Objectives in registering archeological sites through the Kentucky Archeological Registry are the same as those of the natural areas registry programs. These objectives can be summarized by paraphrasing the objectives outlined in TNC's Midwest Regional Office's Guidelines for Registry Workers (Midwest Regional Office, The Nature Conservancy 1985, p 2).

- a. To provide to property owners information which prevents the unintentional or accidental destruction of archeological sites, including educating landowners about not only the significance of their site, but about the lifeways of the people who once lived there;
- b. To discover the landowners' attitudes toward the property and the sites(s) found thereon;
- c. To instill within the owner a sense that his land is special, and that he is a special person for owning it; and to acknowledge that in many cases the site remains (when most of the surrounding sites have been destroyed or degraded) only because they have taken deliberate protective measures;
- d. To instill within the owner a sense of responsibility, at least for monitoring the site; and
- e. To establish a cordial, personal relationship between the owner and the Registry Coordinator that will insure that the archeological site is protected in private ownership.

Participants in the Kentucky Archeological Registry are asked to preserve and protect their site, notify the sponsoring agency (in this case, the Kentucky Heritage Council) of any threats to the site, and of any intent to sell or transfer ownership. The Heritage Council provides management assistance and upon request, aids landowners in selecting the most appropriate tools for stronger site protection.

A landowner can participate in the Registry program in one of two ways: by verbally agreeing to protect the site, or by signing a nonbinding Registry Agreement. Awards are given to participating landowners commensurate with their level of participation (i.e., a certificate, or a certificate and a plaque) and the site is designated a Kentucky Archeological Landmark. Landowner's names are also put on the Heritage Council's mailing list and every two months they receive the Heritage Council's preservations newsletter which includes a section about the Registry program. Figure 1 depicts the steps in the landowner contact/site registration process.

Site Selection Methodology

A site must have been identified, located, and basic descriptive information recorded for it before it can be considered for registry. Next, it must meet significance criteria. The integrity of any landowner contact/registry program, and therefore its effectiveness as a preservation tool, is directly related to the integrity of the sites selected for preservation

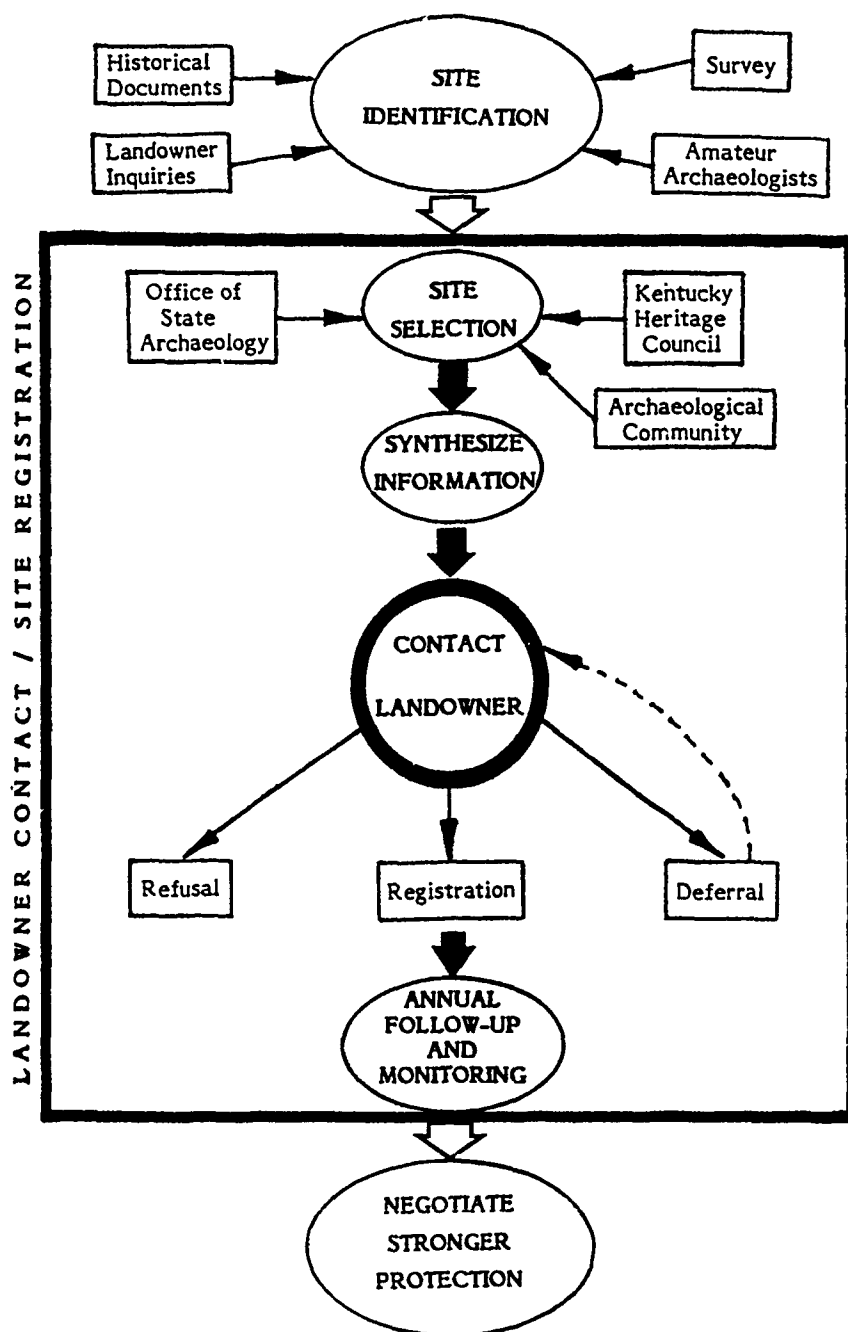


Figure 1. Flowchart of landowner contact/site registration activities

(Carmony 1984, p 2; Hoose 1981, p 59). Sites worth preserving and protecting should be among the most important and significant sites.

At this stage in the Kentucky Archeological Registry's development, general significance criteria determine whether or not a site will qualify as a registry site. A site must (a) have contributed to or have the potential to contribute to an understanding of Kentucky's prehistoric and/or historic past, and (b) be in a good state of preservation. In the future, potential Registry sites will be drawn from those sites determined to be important as identified in the State Plan.

The Landowner Contact/Site Registration Process

Once a site is selected, the process of landowner contact/site registration follows a series of prescribed steps designed to collect all pertinent information about the site, the property, and its owner before the landowner is visited, and to accurately document the results of the Registry Visit and any subsequent communication. These steps are briefly described in the following section and are discussed in more detail in Henderson (1988, pp 21-42).

Pre-visit Activities

These activities consist of preparing program materials, creating the Registry Site Files, initiating contact with landowners, and developing the Landowner Site Packet. The preparation of program materials includes the development of educational, explanatory, and administrative materials, such as registry letterhead, a brochure, awards that will be presented when a landowner agrees to participate, handouts that describe selected archeological topics, and an Administrative Log.

The development of the Registry Site Files includes collecting and synthesizing information about each site and its landowner(s). This includes amassing information about the environmental and archeological aspects of the site, the site's significance, known threats; and also current information about the landowner(s) and the property on which the site is located, and the landowner'(s) attitude toward the site and its preservation. This is accomplished by reviewing all available printed matter regarding the site, such as reports and papers, as well as previous correspondence, such as letters from

landowners, newspaper clippings, and compliance review letters and by means of interviews.

The archeologist who has been most involved in research at the site, referred to as the Archeologist of Record (AOR), may be the single most helpful source of information regarding the site. AORs have the advantage of knowing the landowner, the site, and their common histories in more detail than most other informants.

The landowner is contacted twice before the Registry Visit takes place. The first contact is by mail. A brief descriptive statement about the program is included in the letter, accompanied by the brochure that summarizes the Registry program and by a brochure that outlines Kentucky prehistory. Next, the landowner is contacted by telephone to set up an appointment to visit.

The Landowner Site Packet, which is left with the landowner at the end of the visit, is an individualized collection of information that helps to illustrate and clarify aspects about the Registry program. Another purpose of the Landowner Site Packet is to educate the landowner about the site and its significance. The Landowner Site Packet contains general information about the program, as well as specific information about the site, and where warranted, information about other archeological topics. It also contains the Registry Agreement. This agreement consists of a topographic map with the site boundaries and the landowner boundaries outlined on it, and a cover page that briefly describes the site, its significance, and the preservation commitment the landowner is being asked to make.

Separate rosters of Registry contacts are kept in the Site File for each landowner/site combination, including copies of all correspondence, notes about each telephone call, and notations concerning each time the site was visited or the landowner(s) were visited or contacted. Particular management/stewardship considerations for the site are also outlined and included in the file.

The Visit

The Registry Visit is the focal point of the landowner contact/site registration process, for it is during the visit that the Registry Coordinator initiates and lays the foundation for the long-term preservation commitment the landowner will be asked to make. The Registry Coordinator must be prepared to talk about the site in detail, since one of the purposes of the

Kentucky Archeological Registry is to educate the landowner about his site (how old it is; who its inhabitants were, what they wore, and how they lived; diagnostic artifacts, their method of manufacture, and their source of recovery) and its significance.

Some landowners will decide to participate in the program and sign the agreement during the visit. Others will wish to think it over and discuss it with family members.

Post-visit Activities

After the Registry visit, many of the immediate follow-up activities that take place hinge completely upon the outcome of the visit. A few activities, however, take place immediately after each visit, irrespective of the landowner's decision regarding site registration. They fall into two categories: recording information and communicating with the landowner.

A number of different kinds of information, recorded and kept on file in the Registry Site File, are collected during the Registry visit. This information is critically important to future visits, because it serves as a baseline from which to monitor the site's condition on subsequent visits, and can provide insight into which stronger protection options would be most appropriate to pursue in a particular landowner/site situation should this information be requested.

A description of the visit itself is prepared, which includes a description of the activities engaged in during the visit, the Registry Coordinator's feelings about the landowner's reception to the program and site preservation, the results of the visit, and the topics discussed. Facts gathered about the landowner, his education, economic situation, details about his life and family, perspective about the site and site preservation are summarized in a separate report. Information detailing the condition of the site, location and degree of vandalism, ground disturbance, etc. is noted in a third report.

As soon as possible after the Registry Visit, a thank-you letter is sent to the landowner. If the landowner agreed to participate in the program, the letter also mentions the awards that the landowner will receive and reiterates the agreement the landowner made. If the landowner expressed interest in learning about other protection options, this information is also provided (see, for example, Milne (1984)).

If the landowner agreed to participate in the Registry program, a number of additional activities are undertaken. The most important is to begin preparation of the awards. Press releases are written only with the landowner's permission and only for sites that are not at a high risk of vandalism.

Other tasks that are carried out soon after the visit include adding the landowner's name to the Heritage Council's preservation mailing list, and sending a photocopy of the Agreement to the landowner. About a month after the thank-you letter is sent, the SHPO/Director of the Kentucky Heritage Council sends a letter to the landowner personally expressing appreciation at his decision to participate.

If the landowner did not agree to participate during the course of the Registry visit, but wished to think it over, the thank-you letter is followed up with a telephone call no later than 1 month after the visit. If the answer is yes, the activities discussed above are carried out.

A thank-you letter is sent after the Registry visit even if the landowner is clearly not interested in participating. Further, an attempt to contact the landowner again in 6 months or a year with a request to reconsider his decision may be appropriate.

Registry Maintenance Activities

Registry follow-up and maintenance activities are critically important components of landowner contact/site registration (Hoose 1981, p 56), especially for the most significant registered sites. The goals of maintenance activities at registered sites consist of the following:

- a. Enhancing and continuing to build a relationship with the landowner.
- b. Educating the landowner about the site and its preservation.
- c. Providing site management support and protection information.
- d. Monitoring the site for any disturbance or new threats to its protection.

Communication with the landowner should occur periodically throughout the year. The landowner should be visited once each year, and the site's condition monitored at that time. In lieu of a site visit, the landowner should be telephoned, and the site condition discussed. A newsletter that both informs and educates is an excellent way to maintain communication. It reminds landowners of their participation in the program, the agreement they

have made, and the Registry Coordinator's appreciation for their preservation commitment.

Conclusions

The results of landowner contact/site registration activities undertaken during the Kentucky Archeological Registry's first year of operation were very positive. After 7 months of full-time registry activities, 16 (59 percent) of the 27 landowners contacted in person by the Registry Coordinator agreed to participate in this voluntary protection program. Three landowners (11 percent) declined to participate, and eight (30 percent) deferred site registration. The 16 registries represent registration for 18 archeological sites, totalling 294 acres.

The Kentucky Archeological Registry represents a cost-effective way to provide minimal site protection by enlisting the aid of landowners in the preservation of their site. At the same time, the Registry program provides an opportunity to educate the landowner about the site, its importance, and his role in its continued preservation, as well as an opportunity to systematically monitor the preservation of significant sites. Also, it can help build a constituency for archeological site protection, as well as for archeology in general, and can serve as an effective public relations tool for the sponsoring agency. Landowner contact/site registration represents a programmatic response to long-term protection and preservation of significant archeological sites on private property that can be a useful site protection strategy in and of itself.

Landowner contact/site registration has been proven to be effective in the protection and preservation of natural areas for several years, and if the results of the Kentucky Archeological Registry's first year of operation are any indication, an effective approach to the protection of archeological sites on private property as well.

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Finally, the author would like to acknowledge the landowners who agreed to participate in the Kentucky Archeological Registry. Because of them, there will be a future for the past.

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The Greer Mound Project: Achieving Site
Preservation Within a Federal Bureaucracy

by

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Introduction

This paper will examine the process by which an archeological site preservation project is authorized, planned, executed, and reported by a Corps of Engineers District. The significance of this project lies in the insight derived from a critical analysis of the decision-making process that led to the expenditure of \$110,000 of public funds to preserve an archeological site that had been long neglected. Hopefully, such bureaucratic introspection will assist other agencies in determining what anthropological factors are critical in creating a preservation ethic and then implementing that ethic successfully.

The Greer Mound Project is a success story because key personnel inside the Corps believed in the worth of site preservation. Prior to this particular project the District's attitude toward sites like this was one of benign neglect. Only the threat of litigation could precipitate the mitigation of a project's adverse effects through data recovery. Since the completion of the Greer Mound Project, site preservation has come to be regarded in the Little Rock District as a viable middle course between traditional neglect and expensive data recovery. This paper will focus on how this change in attitude came about.

Background

The Greer Mound Site (3JE50) is a prehistoric Quapaw mound site with a pre-Civil War cemetery on top of the mound. It is located near Wright, AR in Pool 5 of the McClellan-Kerr Arkansas River Navigation System. The central feature of the site is a truncated platform mound. The site is situated on the outside curve of Brodie Bend, a cut-off channel created when Lock and Dam No. 5 was completed in 1968. At the time the navigation system was created, the Corps acquired a flowage easement in Brodie Bend to elevation 216 ft above mean sea level. This rise in water level prompted a letter in May, 1968 from

Dr. John Griffin, Chief of the Southeast Archeological Center of the National Park Service. Writing to the Little Rock District Engineer, he expressed concern that the increased water levels would adversely affect this important site.

C. B. Moore had visited the Greer Mound site and described it in a 1908 publication entitled "Certain Mounds of Arkansas and Mississippi."* Like most Southeastern archeologists, Griffin was very familiar with Moore's pioneering work. Moore's publications represent an invaluable source of information on many of the most significant sites in the south. At the Greer Mound Site, Moore excavated over 80 prehistoric Indian burials and recovered over 160 intact ceramic vessels. Extensive collections from the site exist in the Gilcrease Museum (Tulsa, OK), the Heye Foundation (New York City), and the University of Arkansas Museum in Fayetteville. A cemetery was established on top of the site's only mound in 1841 and continued in operation until 1913. With this information in mind, Griffin's concern for the site is quite understandable.

The Corps' response to Dr. Griffin's letter came from the Chief of the District's Operations Division, D. A. Schmand, who pointed out that the District had no work planned or contemplated in the abandoned bendway, with the exception of a limited program for the clearing of trails for small fishing boats and the removal of willow growth below elevation 213 ft. Schmand indicated that this work would not affect the mound but that any permits issued under Sec. 10 of the Rivers and Harbors Act for the construction of boat docks and other facilities would be carefully reviewed for potential impacts to the site. The tone of Schmand's letter reflects his confidence that no problem would ever be encountered.

During the next decade the Corps' file on the Greer Mound Site contains no reference to the steady bank erosion caused by the increase in water levels. Aerial photographs, however, document the encroachment of the river on the buffer zone of bank between the bendway, and the mound. In 1978, John House, an archeologist with the Arkansas Archeological Survey, visited the site during an inspection of two permit applications to stabilize the bank north and south of the mound. House wrote a letter to the Arkansas State Archeologist in September 1978 and indicated that the bank erosion was

* Moore, C. B. 1908. "Certain Mounds of Arkansas and Mississippi," Journal of the Academy of Natural Sciences, Philadelphia, PA.

becoming serious. He recommended clearance of the two permits for bank stabilization. These early efforts used tires, buried telephone poles, cables, anything, and everything.

House met with representatives from the District's Environmental Section and the nearby Pine Bluff Resident Office around this time. The Corps' position was that no public funds could be expended but permit applications from private individuals seeking to protect the historic cemetery would be granted. This situation continued for the next 8 years. Erosion continued in spite of the best efforts of private individuals to protect the bank. The full force of the Arkansas River current struck the bank under high flow conditions in the fall and spring. The toe of the bank would be eaten away by the strong current and the top portion of the bank would collapse along with the temporary attempts to solve the problem. Clearly, this Band-Aid approach was not working.

Struggle for Authorization

During the month of October 1986, the Arkansas River levels reached record highs following tremendous rainfall in Oklahoma and western Arkansas. The situation at the Greer Mound became critical after water levels in Brodie Bend overtopped the Corps' flowage easement elevation of 216 ft. On November 18, 1986, Mr. Hal Lee, Chief of the Resource Management Section at the Pine Bluff Resident Office telephoned the Environmental Analysis Branch to notify the District Archeologist that human remains were being exposed by the bank erosion. Mr. and Mrs. Edward Garey (local residents) had notified the Pine Bluff Resident Office that the recent high water had caused additional bank caving and that a casket had washed out of the upper portion of the mound.

On November 20, I visited the site and met with the landowner Mr. Frank Hankins, Mr. and Mrs. Garey, and Dr. Martha Rolingson of the Arkansas Archeological Survey. Dr. Rolingson is the Station Archeologist at Toltec Mounds State Park just a few miles upstream and has done research on the Plum Bayou culture manifested at Toltec and possibly at the Greer Site also. The situation we encountered was grim. The mound was rapidly being lost as a direct result of the erosion of the toe of the left bank which appeared to be within our flood easement. Positive action would have to be taken as soon as possible if the mound was to be saved.

Two questions had to be resolved. First, what was our legal responsibility? Second, assuming we had some responsibility, what was the best way to deal with the erosion problem? To address the first question, I contacted the Corps' Southwestern Division (SWD) Archeologist, Mr. Larry Banks, and the South Atlantic Division Archeologist, Mr. Marc Rucker. I discovered that we did not have any involvement under the Authority of Section 14 of the Flood Control Act of 1946, as amended (33 U.S.C. 70L r). According to Mr. Banks, the District could only be guided by the Corps' draft regulation ER 1130-2-438* which applies to the construction, operation, and maintenance of civil works projects. That regulation states:

On lands held in less than fee by the Federal government under Corps of Engineers jurisdiction, the District Commander has the same responsibility for historic properties whenever activities generated by the Corps will have an adverse impact on those historic properties. If required, the Corps is empowered to acquire the necessary real estate interests to enable it to carry out the intent of Congress in mitigating adverse impacts to historic properties resulting from Corps activities.

Unfortunately, in November, 1986 this regulation was still in draft form and the entire portion of the regulation was subject to change. Certainly, the Real Estate Division management was not going to abide by a draft regulation not yet in force. Incidentally, the regulation was not approved in final form until October 26, 1987, well after the completion of our project.

Marc Rucker, at the Corps' South Atlantic Division Office in Atlanta, ultimately provided us with the key to resolving the jurisdiction problem. He provided a legal opinion by the Corps' Chief Counsel, Lester Edelman, justifying the mitigation of potential National Register properties outside Corps' project boundaries. A precedent had been set in February 1980 by decisions on the Keystone Project in El Paso, TX, and the Stonewall Jackson Lake Project in West Virginia. Edelman ruled that any potential National Register sites that are irreparably lost or destroyed through indirect activities, such as the raising of the normal water level, shall be subject to the authority of the Corps to undertake the recovery, protection, and preservation of such data. Edelman's opinion was that:

- a. The Reservoir Salvage Act, as amended (1-percent law) authorizes both evaluation and mitigative measures on

* US Army Corps of Engineers. 1987. Engineer Regulation 1130-2-438, "Historic Preservation Program," Washington, DC.

non-Federal lands (including flowage easement lands) when it is demonstrable that the project "may cause irreparable loss or destruction..."

- b. The Corps has the general authority "to acquire the necessary real estate interests," to conduct required investigations, if need be, in order to gain access to, and rights in, such affected sites.

Given this, it would be critical to show that the normal operation of the Arkansas River navigation system was causing irreparable loss to the Greer Mound Site. Furthermore, we needed formal state Historic Preservation Office concurrence that the site was eligible for the National Register. On November 25 we received a letter from the Arkansas State Archeologists concurring with our own determination of eligibility primarily based on C. B. Moore's excavations in the prehistoric cemetery area of the site. Even prior to this, however, I had begun putting together a team that could meet the technical challenge of saving this site.

First, I requested that Dr. James Hester of the Corps' Waterways Experiment Station provide us with his technical expertise at an onsite meeting on November 24. Next, I persuaded the Chief of River Design Branch, Mr. Jack Woolfolk, to attend that same meeting, assuring him that project authorization was imminent, a small departure from the real state of affairs. I also persuaded the Chief of Survey Branch, Mr. Bob Sanderlin, to send a crew down to establish the precise elevation where our flowage easement ended on the bankline. If we could show that a National Register eligible site was rapidly being lost as a direct result of the erosion of the toe and that the toe was within our flowage easement, I was confident the project would be authorized. As it turned out, Bob Sanderlin himself acted as the rod man for the establishment of that critical 216-ft elevation.

The bitterly cold onsite meeting of November 24, 1987 was a critical one. Present were Drs. Hester and Rolingson, the landowner, Mr. Hankins, the Gareys, the Chief of River Design, the Chief of Survey, and myself. We formally established that normal pool operations were indeed eroding the toe of the bank which was within our flowage easement. We also began to plan how the site could be preserved. The three archeologists present estimated the cost of full-scale data recovery in excess of \$200,000. A program of bank stabilization with sufficient data recovery to record details of the mound's construction came to the forefront as the preferred alternative. Engineer Woolfolk gave us a rough estimate for bank stabilization of around \$100,000.

He outlined a plan in which quarry run stone would be brought up the bendway to the site by barge. A new toe would be constructed of stone. Earth fill would be obtained from dredging and from nearby sandbars and filled in behind the stone toe to create a stable IV:3H slope. Turf would then be established on the bank above the bank paving. Dr. Rolingson outlined a plan to prepare a detailed stratigraphic profile of the mound that would recover data on the mound's construction and function.

Following that meeting I prepared a memorandum for the District Engineer, COL Robert Whitehead, to be signed by the Chief of Planning Division, Mr. David Burrough. That memorandum received careful scrutiny by Mr. Burrough and the Acting Chief of the Environmental Analysis Branch, Mr. Dale Leggett. We all wanted to protect the site but we wanted to be sure we had a real legal responsibility. Careful scrutiny of the Edelman opinion and the continued assurance of Larry Banks in Dallas finally prevailed. Following submission of the memorandum by the Chief of Planning Division on November 25, we began a program of site monitoring. This work was coordinated by Hal Lee of our Pine Bluff Resident Office and conducted by our rangers. No further bank caving occurred throughout the winter of 1986-87. On January 16, 1987, COL Whitehead approved the project. Now began the serious business of securing funding and getting the project designed.

In early February I prepared an information report for SWD which outlined the need for the project, the significance of the site and the Corps' legal responsibilities. By this time we had also received Hester's technical report and recommendations for site preservation. We also encountered a major obstacle at this point. There was no funding available, and without funding the River Design Branch could not proceed with the design of the project. At this time a grass-roots effort began in earnest. Spearheaded by David Burrough, the Chief of Planning Division, we began a campaign for funding that was primarily directed at Program Support Branch and the Construction-Operations Division. The persistence of Mr. Burrough and myself to secure funding finally paid off and on March 6 we were able to notify SWD that we were proceeding with the necessary bank stabilization using operations and maintenance funds.

With the project authorized and funding secured, we were finally able to address the central issue, how best to protect the site. The first problem was to determine the boundaries of the prehistoric component. This would determine the precise horizontal extent of the bank stabilization.

Dr. Rolingson at Toltec Mounds State Park had already begun an extensive study of Moore's report and field notes and had determined that the prehistoric cemetery Moore had excavated was about 120 ft northeast of the mound. We needed to know how far beyond this the artifact concentration extended. On May 15 another onsite meeting was held, and this time Robert Young, the engineer assigned to design the project, also attended. Drs. Hester and Rolingson also provided their technical expertise. We located a dark-stained midden that began about 200 ft south of the mound in the cultivated field adjacent to the mound. The artifact scatter continued for about 500 ft paralleling the bendway. The eastern portion of the site continued to the existing levee. Coring in the plowed field showed a dark greasy buried A soil horizon indicative of an intensive long-term prehistoric occupation. In terms of the engineering design, protecting just the mound would not be enough. While it was the site's most conspicuous feature it was not the most important. The buried deposits east of the mound were the reason for the site's National Register eligibility. The prehistoric component's research potential was the key. If the site had consisted only of a historic cemetery, the Corps would not have been able to save the site. Cemeteries are usually excluded from National Register listing unless they derive their primary significance from graves of persons of transcendent importance, from age, from distinctive design values, or from association with historic events. None of these applied to the small family cemetery on top of the Greer Mound.

The meeting of May 14 settled several issues. Robert Young's preliminary design required no cutting back of the existing bank. Rather, it called for the construction of a new toe from quarry run stone and filling in behind that toe to establish a stable 3-on-1 slope. The archeological consequences of this were that a stratigraphic profile had to be recorded before the stabilization project began. To record the details of mound construction we needed a clean vertical face extending along the horizontal extent of the mound and a little beyond. This would be a major job, given the poor state of the bank. We also wanted to have that face exposed to the elements and to potential illegal digging by artifact collectors for the shortest possible period of time. With Young's estimate of mid-August as the time for actual construction to start we scheduled the stratigraphic profiling to be done in July.

Archeological Data Recovery

On May 19, 1987, Dr. Rolingson sent a letter to the Arkansas State Archeologist, Dr. Hester Davis.* She recommended an exposure 2 or 3 m wide and perhaps 5 m high. The profile would be recorded by photographs and scale drawings.

The profiling effort created a contractual dilemma. Dr. Rolingson was the most qualified archeologist to do the work given her vast experience at the nearby Toltec Mounds Site and her familiarity with the Greer Site. She was, however, an employee of the Arkansas Archeological Survey and a sole source procurement to the Survey could not be justified. On the other hand, the archeological firm the District already had on an indefinite delivery contract was immersed in a labor-intensive survey and testing project at Fort Chaffee, with several more projects planned at the District's lake projects. The solution to this contract problem was to make this a joint effort between the District and Survey Archeologist Dr. Rolingson.

The plan ultimately proposed to the State Archeologist was to use Dr. Rolingson as the principal investigator for the profiling and report preparation. District personnel would comprise the field crew. This collaboration accomplished two major objectives. First, it reduced the archeological profiling cost to a level where we could procure the services of Dr. Rolingson noncompetitively and make use of an existing Blanket Purchase Agreement with the Arkansas Archeological Survey. Secondly, it provided a means for District personnel to actively participate in the preservation of this site.

The limited data recovery began at the Greer Mound Site on July 13, 1987 and continued through July 17. When she arrived onsite that first morning, Dr. Rolingson found that

The water level was down, but there was a rank growth of vegetation and the soil was as hard as concrete. The primary effort went into a profile of the mound and soils below it on the exposed and eroding bank. This profile was 7 m long and 2 m high, with one section 3.30 m high. We cleaned and more or less straightened this face and recorded the location of artifacts in it. The cleaned face showed an upper mound fill deposit some 50 cm thick; a 20-cm zone of burned daub rubble from a building on the mound; a 50-cm zone of black clay mound fill; and a middle zone beneath the mound. The work demanded close cooperation among the crew, as we

* Personal Communication, 19 May 1987, Martha Ann Rolingson, Archeologist, Arkansas Archeological Survey, Toltec Mounds State Park, AR.

had to stand on a narrow ledge that threatened to collapse. We were not able to find a place away from the mound along the bank line to do another profile because of the thick vegetation. (Rolingson 1987, p 6).*

Following the completion of the profile of the mound there followed several days of artifact processing and planning the logistics of report preparation. We also began planning the preparation of a second profile to be done during the construction phase.

Construction and Monitoring

Construction of the bank stabilization began on October 21, 1987. On that first morning the construction contractor used a clamshell bucket mounted on a barge to strip vegetation along the 500 ft of bank line that was to be stabilized. Once the bank was cleared, John Riggs of the Little Rock District and Dr. Rolingson began work on the second profile. They used a ledge even more precarious than the one used for the profiling of the mound. This second profile provided additional data that had not been found at the mound profile, including a greater number of artifacts and wider range of pottery types. A third profile, the south profile, was cleared and recorded when some existing steps to a dock owned by the Gareys were removed.

On the afternoon of the first day, the crew began the dumping of stone to stabilize and rebuild the eroded toe. On October 22, rock dumping continued as did the archeological work on the north profile. On October 23, the construction of the new toe was completed and the excavation of dirt from the channel began. October 24th saw the filling in behind the rock dike. This process was completed on October 26, whereupon sod was laid to prevent erosion of the newly placed soil. From the work done to date Dr. Rolingson has concluded:

It is evident that the site, although damaged, still is an important source of data on the late prehistoric-early protohistoric period along the lower Arkansas River. The objectives of this profiling project were limited but they demonstrate that the site does need to be preserved, that it is eligible for nomination to the National Register, and that future investigation will be rewarding. (Rolingson 1987, p 7).

* Rolingson, Martha Ann. 1987. "Investigation and Stabilization of the Greer Site (3JE50)." Field Notes, Newsletter of the Arkansas Archeological Society, No. 219, Nov-Dec, pp 6-7.

Conclusions

The Greer Mound Project demonstrates that archeological site preservation can be successfully accomplished when the project captures the attention of non-archeologists working within a bureaucracy like the Corps of Engineers. Our earliest efforts were directed towards saving the historic cemetery. When the significance of the prehistoric component became apparent, the whole site became the object of our preservation efforts. The determination of the National Register eligibility of the prehistoric component started the preservation effort forward to its final end. The education of the non-archeologists was crucial in this effort. This is particularly true of engineers without a strong background in social sciences or the humanities.

Secondly, the team approach that was used for the project proved to be invaluable. The preservation of the site became not just my goal as an archeologist. It became the District's goal as well. Planning, Recreation-Resources, River Design, Survey, Program Support, Mapping, Real Estate, and the Pine Bluff Resident Office all participated actively in the project. After a while my job became one of coordinating the work of all these Divisions into a unified whole. The integration of a preservation movement throughout the bureaucracy is crucial for its success.

Comments on Current Issues in Archeological Site
Protection and Preservation*

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Nearly 3 years ago, I was a panelist in a Symposium on Archeological Site Preservation held at the Society of Applied Anthropology meeting in Tampa, FL. At that meeting, I made some observations on the status of site preservation as a *national ethic*. I am going to repeat essentially those same remarks today--not so much because they were so eloquent or profound, but because the audience at our symposium numbered considerably less than the number of persons presenting papers. This graphically illustrated the nature of part of our problem--lack of interest within the profession.

Let me show you one of my favorite editorial cartoons (Figure 1).



Figure 1. Editorial cartoon from *The Commercial Appeal*, Memphis, TN (used with permission)

* Discussion presented at the Symposium "Current Issues in Archeological Site Protection and Preservation," at the 1990 Annual Meeting of the Society for American Archaeology, Las Vegas, NV.

As most of you will recall, the snail darter epitomized the endangered species movement that swept our country about a decade ago. There are many parallels between endangered species and archeological sites, but there is one very fundamental difference--archeological sites are not renewable resources like plants and animals. If we simply let them alone, they will not survive or come back on their own.

During the heyday of the early endangered species movement and legislation, there were strong and outspoken proponents, but there was also considerable apathy and even opposition. I recall comments like "who cares about obscure plants and animals, what good do they do?," "they can take care of themselves," and "what is their economic value--are they worth the expense to save?" Unfortunately, I have heard the same comments made about archeological sites. To make matters worse, archeological sites differ from endangered species in that they often contain artifacts that have developed appreciable commercial value.

As far as site preservation as a national ethic is concerned, I am afraid we are by no means out of the woods and much remains to be accomplished.

From the papers that have been presented in this symposium, we can see that significant progress has been made in developing the technological base for site protection and preservation. We can also see that there are unique problems and that even all of the major Federal agencies are not at the same stage or approaching the problems in the same way.

At the meeting in Tampa that I referred to earlier, I identified 11 elements that I consider to be critical if site preservation is to become institutionalized as a national ethic. I made a scorecard containing value judgments as to how each of the 11 elements ranked in terms of adequacy or inadequacy of effectiveness. The status rankings that I gave at that time are presented in Figure 2. Here are a few observations about the separate elements:

Theory is obviously the first step. Yes, we do have the basic concept that sites can be protected by structural and nonstructural means and that effective preservation can be achieved.

Requirements/mandate refer to administration policy, legislation, agency guidelines, and even sentiment. These are now rather universal; however, as we saw in a paper earlier by Steve Fosberg, some policy conflicts are present and yet to be resolved.

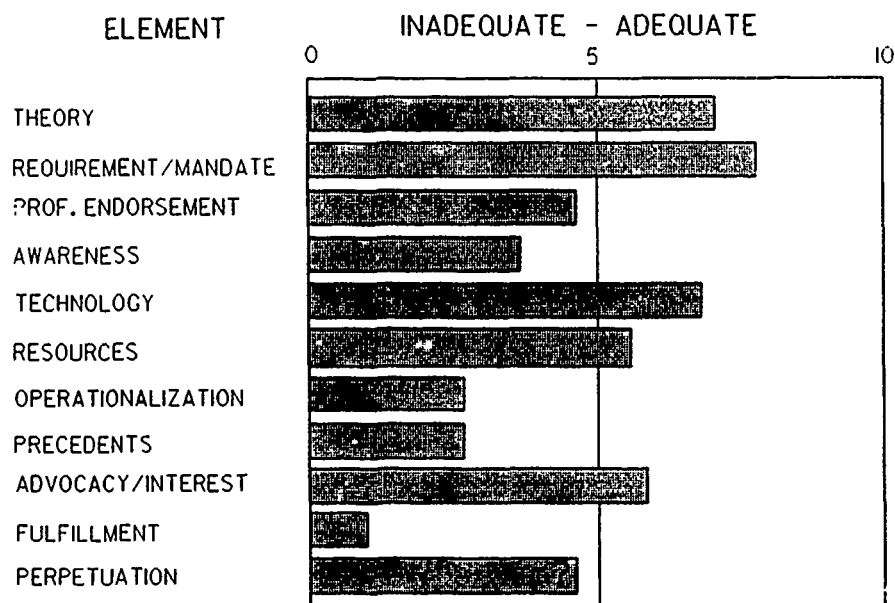


Figure 2. Subjective ranking of site preservation elements

Professional endorsement is the matter of the recognition and support of the professional practitioners. I think we have growing acceptance, but we have a long way to go. The fact that we are having this symposium at the Society for American Archeology (SAA) is a positive sign, but I still have the perception that site preservation is viewed as a threat to academic and intellectual freedom and even financial support. Thus, site protection shares certain problems with cultural resources management in general.

Awareness pertains to the recognition at all levels of our society of the nature and severity of site deterioration and destruction. In terms of status, we are in the inadequate column but catching up rapidly. The present "Save the Past for the Future" initiative is a major step forward.

Technology for site protection involves methods, materials, and guidelines. This is probably the most rapidly advancing of the 11 elements, but technology transfer is lagging. There is still too much experimentation necessary.

Resources refer primarily to dollars. Several papers in this symposium have pointed out that site protection often is less expensive than other options, but we must guard against the inherent danger in this. Site protection/preservation must be selected when it is the *best* alternative, not just the cheapest one.

Operationalization is not a word recognized by Webster, but it is by our bureaucracy. It means are there working procedures and guidelines for getting something done systematically and repetitively? As we have seen from the papers, this varies widely from agency to agency.

Precedents include examples that others can follow. With regard to governmental agencies, this helps immensely in a bureaucracy where there is an inherent fear of doing something for the first time. We have some good examples and the number is growing, but they need to be publicized more.

Advocacy/interest is very important since many actions do not take place without an active proponent. I believe progress has been good in this area since there are some outspoken advocates with success stories to tell.

Fulfillment is achieved when objectives have been met satisfactorily. Success in this element is hard to gauge since the ethic is just beginning and there are few yardsticks to use to measure preservation effectiveness. The outlook is promising, however.

Perpetuation is the ultimate test. Will a preservation ethic become institutionalized? If the theory is sound and effective protection can be achieved on a routine basis, we are well down the right road.

In summary, where do we stand? I see some important advances in just the last 3 years and some of the bars in Figure 2 are a little longer. Technology development is making good progress within the Corps of Engineers and the word is spreading. If I had to select a single element as being most critical for future emphasis, it would be awareness. This symposium has served an important role in this regard and more meetings of this kind are needed in future years.